been made about that time. It was pointed out that recent coatings on Kodalith were showing OK for stripping on all rolls since the stronger type Kodalith sub has been used.

Dr. Eilers mentioned that experiments were being run in building #30 using the type of hardner used in LS Portrait gel for Kodalith gel. This type of hardner is expected to give less wet stripping trouble on Kodalith.

In a general discussion to bring out some method of improvement of stripping on Kodalith, Dr. Nadeau suggested using a mixed nitrate gel sub, which he stated would certainly stick, and which could be put on with a bead hopper to improve general defects such as impressions and sub mottle which are caused by immersion type applications. It was also noted that if trouble from cross lines developed when the regular sub hopper was used, that immersion sub might be resorted to. It was also stated that if cotton were mixed with the gel for Kodalith sub, that a weaker solvent combination could be used which would cut down the amount of waste caused by creases. Mr. Wells suggested running a 200' roll on #53 machine using mixed gel cotton sub to test out this point. It was thought possibly the mixed gel cotton sub might be worse for brittleness than our present Kodalith and this point should be checked.

Safety XRay

Mr. Babcock suggested wxperiments might be started on a modified type of Blue AA for subbing at the present time, inasmuch as Blue AA type sub failed because of crosslines and wet stripping, and it had been found that crosslines possibly could be improved by using the mixed cotton gel sub, and stripping troubles should be improved by the use of our present NS gel with considerably less hardner than was used last year when Blue AA type was being coated. Dr. Nadeau stated that he had the same idea and that experimental work was being started on this very thing. He stated that further improvement should be made by increasing the ratio of gel to cotton in the mixed sub. Mr. Babcock noted that the brittleness on Blue AA type subbing was better in the dry room than any method heretofore attempted when a certain amount of regular subbing gel was mixed in with the DS type gel in the sub manufacture. Brittleness results in some cases were close to 100%.

It was noted that Gevaert XRay was showing particularly good for brittleness at the present time, and stripping results varied from "Vsp" to "Peels easy" on "heaterafter" results. Mr. Wells stated that an approval sheet should be started to run experiments on new Blue AA type subbing.

Mr. Babcock stated that rolls of Safety XRay, class #21 type which were allowed to age for various lengths of time and which contained 1/2 the standard amount of hardner, were all coated to emulsion on the same coating, and stripping results were "vsp" and "OK" on dry stripping and solid OK on wet stripping. These rolls were held for lengths of time up to 12 weeks before coating to emulsion. Mr. Rupert is going to have these rolls strip tested for blister trouble.

C O

Gel for Subbing

Mr. Babcock stated that following a converstion with Mr. Bruce, it would be possible for the Gela tin Plant to deliver to use DS type gel at the same price as regular type gel. Furthermore, it would be an advantage to the Gelatin Plant because it would eliminate considerable washing. It should also be an advantage to Roll Coating since it should eliminate sub throwout and comb-line trouble. It was agreed to look up keeping tests and get necessary approval sheets started in preparation for this change.

NC and Film Pack

Mr. Babcock reported that an approval sheet had been started to use 80% stock of chemical #5 type sub for both Film Pack and NC. The advantage of this would be that blister trouble on Film Pack is eliminated, and that comets with physical developer do not appear with this type sub. Likewise, it will be an advantage for Roll Coating and Emulsion Coating to deliver one common product for both NC and Film Pack.

Class 20 Application: U-coat applied to both sides at #7 and #8 hopper places; color in the 5th hopper, C sub #GH in the #3 and #4 hoppers; regular gel sub in the 1st and 2nd hoppers and gel in the tower.

Class 21: U-coat #x-1061 applied to both sides at the 7th and 8th hoppers; color x-5605 applied in the 5th; regular sub in the 3rd and 4th hoppers, and NS gel in the 1st and 2nd hoppers.

Class 22: CAC sub in 7th and 8th; Color in the 5th hopper.

Class 23: U-coat applied at 7th and 8th hopper; CAC a t the 5th hopper and at the 3rd hopper; Color in the 4th hopper over the CAC; Regular sub in the 1st and 2nd; NS gel in the tower.

Class 24: Same as class 23 but uses cold washed nitrate cotton in the U-coat formula.

Class 25: A 4-1/2% nitrate cotton U-coat solution applied at the 7th and 8th hoppers, blue color in the 5th hopper, FG sub in the 4th hopper, FFG in the 2nd hopper, and gel sub at the 1st hopper.

Samples of U-coat from the circulating system had been delivered to building #45 to be analyzed for percentage of #63 but as yet results secured are not reliable. They will attempt to give us better figures next week.

Dr. Nadeau recalled that when the support showed stripping and was reversed that the stripping went with the base. However, this information was only secured on one test and it was agreed to deliver additional tests during the week where the samples were reversed in a test roll to see whether this difference still held at the present time.

Subbing Gel

Mr. Babcock mentioned that at the present time three different gels were being used for sub making, these gels varying in pH from 5.0 to 6.0. He suggested that since DS Gel was being exchanged for regular gel in many cases to improve sub applications, that it should be possible to reduce our gel stock to two different types instead of three, one of which would be DS of pH 5.0 and the other other regular type of pH 5.8 Dr. Nadeau suggested that the regular type also be reduced to pH of 5.0. It was recalled that a gel of pH 5.0 is more pure than a gel of pH 5.7 or pH of 6.0 owing to the fact that the method of raising the pH is to wash more extensively with lake water, which process simply results in an increase of percent alkaline ash in the gel. It was decided to review this situation with Mr. Bruce.

Sub Conference of December 11, 1936

Kodachrome

A 12,000' coating of Kodachrome made on #53 machine during the past week used a mixture of gel and acetate cotton in the subbing. This coating, it was found, showed bad dry stripping on the side corresponding to the overflow of the sub from the hopper, and it was actually determined from the rate of consumption of the sub that 16 lbs. only had been added in the hopper per hour whereas the orders were that 32 lbs. per hour should be drawn off. Following this experience, Dr. Kilgra reported that a log sheet had been supplied to the machine to be filled out when ever the Kodachrome coating was made and that foremen's attention had been called to the fact that sub must be run considerably faster. After the above experience 24,000 additional feet of support was made using the same subbing technique except that a drawoff of 32 lbs. per hour were taken and center-feed hopper being used in this operation. 5' stripping tests from this support taken, and when coated to Cine Positive emulsion, gave OK adhesion over the entire width.

Mr. Wynd reported that 35 mm. Kodachrome as now coated and perforated showed bad cracking when support is pulled thru Contax Camera. If the regular Kodak Standard perforation is used, there is no cracking. The cracking occurs at the present time only on Bell-Howell perforation of the 35mm. Kodachrome. Experiments are being run at the present time to determine whether or not the fish tail perforation against different standard perforations causes a difference in the emulsion cracking at low humidity.

Mr. Babcock reported that brittleness of the gel cotton subbed material was slightly better than the old type C sub followed by 2 gel subs had been. Comparisons were as follows:

Old type	2 hrs. at 22% R.H.	0	0	
" "	2 " " 23% R.H.	0	10	
New "	2 " " 22% R.H.	23	10	
" "	2 " " 23% R.H.			

Translite

Mr. Babcock reported that a recent coating of Translite showed Vsp to OK for stripping, and 80 to 100% results for brittleness taken at 14% R.H. He also reported that a small sample of Translite coated to Translite emulsion had been coated to XRay emulsion, and that dry stripping and brittleness were good, however wet stripping was bad, the separation occurring between the Translite and XRay emulsion. It was decided to coat a small piece of Translite base directly to XRay emulsion to see what the stripping and brittleness would be.

L.S.Cut Sheet

Mr. Babcock reported that a dozen rolls of LS Portrait from #33 machine, recent product, had been coated to Pelloid, and that one of the above rolls had been coated to the finish coat of emulsion, this roll being solid OK for stripping. The remaining rolls in the coating were scheduled to be finished over the weekend. The roll coated was 5105-487-3.

Mr. Babcock showed a set of stripping tests on LS Cut Sheet of product that formerly showed "peels h" on the OS side, the U-coa t separating from the base. In this set of tests the samples were reversed so that in once case the emulsion would be coated to the OS side, and in the other case the gel would be coated to the OS side, but stripping in most cases was on the OS side, no matter whether samples were reversed or not. This confirmed our previous findings that the fault in this material lies in the subbing and separation occurs on the OS side. It was noted, however, that all of the rétests taken, where the coating was made in the standard manner, were passable for stripping, and it was agreed to send over some more tests to be coated in an effort to release more of this product for Portrait coatings using clear gel.

Dr. Nadeau suggested increasing the speed of coating on #33 machine above the 300' mark. After some discussion, it was agreed to wait until dope temperature had been raised, and also to see how flatness results came out on the high speed material b efore making any further increase in the speed.

In connection with material being held for poor stripping, it was mantioned that dye retention results would probably also be poor, inasmuch as standard for dye retention had been recently raised, following the weakening of the sub on the one process machines. It was, therefore, decided to have a piece of this product coated to Super Sensitive Portrait with red anti-halation backing. It was considered advisable to take this step inasmuch as it was reported that an approval sheet might be going thru very shortly which woul eliminate all clear gel coating of Portrait in favor of the anti-halation types.

Dr. Nadeau reported that the new fans for #31 and #32 machines have not as yet a rrived at Kodak Park.

Safety Xray

6 It was reported that Mr. Rupert had finished testing the Safety Xray rolls which had been allowed to age for various lengths of time, and he reported more of a tendency to blister on the rolls 8 weeks old than were found on the rolls 4 weeks old, or the freshly coated type. Mr. Seel, therefore, asked us to take steps to have the product over 4 weeks old coated to emuasion as soon as possible. The following stock of XRay was reported on hand:

140,000'	4	weeks old.
50,000'	5	" "
25,000'	6	" "

Mr. Wells stated that he wished a tabulation of these rolls. Mr. Seel also requested us to start another series of experiments in which another set of rolls would be allowed to age for various lengths of time up to 1, 2, and 3 months. In each set of rolls there would be included on roll of XRay with standard amount of hardner in NS gel and one roll without the hardner.

It was reported that the last series of 10 rolls of Safety Xray using no hardner in the NS Gel, that 7 rolls had been coated to emulsion and were solid OK for stripping.

The question of changing all machines to 1/4 the amount of hardner in the NS gel was discussed. Dr. Eilers stated that he would get his information together and endeavor to secure general approval of this move, which was expected to be a help on wet stripping troubles as well as other defects.

Dr. Eilers stated that vibration lines were appearing on #56 machine. Mr. Wells suggested to have the wheel buffed after which it could be decided whether or not the wheel should be changed. Vibration lines do not occur when the rolls coated are on the thick side of the standard thickness.

Mr. Babcock reported that the regular subs made up with ethyl alcohol showed no improvement in stripping and brittleness.

Australian Cut Sheet

It was noted that an approval sheet had beeen started to deliver class #21 type XRay for Australia instead of class #23. This move would diminate the necessity of using our gel towers, which are not in use at the present time.

London XRay

With reference to the broad color lines experienced on London XRay, it was reported that inasmuch as 2 trials made recently where heavier U-coat was used had not been successful in the application of the dye, that we would try the method of class #23 type of subbing on #55 and #35 machines in order to get out of color line trouble.

Nitrogen in Chemical #5. — malonic acid

Mr. Babcock reported that in a recent analysis of chemical #5, less than 0.04% nitrogen was reported.

Ash in Filtered U-coat

Ash results secured on nitrate U-coat filtered under different conditions were determined by Mr. Folwell. Results of these tests are as follows:

Centrifuged	0.99
" and filtered thru clam shell	0.72
" and filtered thru Karl Kieffer press	0.62

It is, therefore, apparent that some of the ash is soluble in our solvents, inasmuch as the Karl Kieffer sample was entirely clear and free of haze, for insoluble particles.

In a discussion of further reduction in the hardner on NS gel, it was felt that inasmuch as "rabbit tr[illegible]" trouble had improved when going from 1/2 to 1/4 hardner that it would be desirable to put all machines on 1/4 hardner. Sufficient information has been obtained on stripping to justify this move. It was decided to change the approval sheet to go to 1/4 hardner instead of going to no hardner. It was also decided to coat 10 more rolls on #47 machine using no hardner in the NS gel, inasmuch as previously a one roll, two roll, and 5 roll coating had shown OK for stripping.

Dr. Nadeau inquired about weakening the subs to improve briggleness. Dr. Eilers stated that this had been done; all machines were using G sub except #47 which was using GH. It is not possible to coat much weaker than GH and still obtain OK results on stripping although a series of stripping tests showed we could go to J sub before getting into stripping trouble.

Dr. Nadeau suggested putting another machine on class #25, inasmuch as stripping on this type of XRay continued to be OK. Dr. Eilers stated that it was reported that building #29's cups dig in more on class #25 than on class #21, although they are not coating waste. This point was questioned inasmuch as it was felt that NS gel application was causing trouble at building #29, and that class #25 product, where NS gel application was omitted on one side whould show an improvement in this point. Mr. Wells asked Dr. Eilers to check into this situation with Mr. Paddock.

LS Cut Sheet

Mr. Babcock stated that stripping had been passable on LS Cut Sheet with the exception of "str h" on Pelloid side on #33 machine. Dr. Eilers stated that recent nitrogen result was .19 and shrinkage was .26. Shrinkage had gone up .06. Flatness tests are going thru. Speed of #33 machine has been increased to 300'. Mr. Wells asked to have this speed maintained on #33 machine and not increased for awhile until it was definitely determined that we could operate successfully.

Mr. Babcock stated that the LS Cut Sheet showing "peels h" from the base had been reveiwed during the last week, and retests were taken of rolls that looked as though they migh be passed for stripping and that of nie tests heard from to the present time all were passable for stripping. Mr. Wells stated that this material should not be resubbed but should be converted into leaders unless it could be released as it is. Dr. Eilers reported that one roll being used for leader experiment would be slit and perforated today.

Mr. Babcock stated that the presence of tri-phenyl phosphate on the SS as compared with the OS side had been determined to assure ourselves that the SS side contained an appreciably larger percent of softerner than the OS. Results are as follows:

AP2000	#1 OS side - 20.6%	#1 SS side - 23.6%
Dope	#2 OS side - 20.7%	#2 SS side - 23.5%

The above was in accordance with our present belief.

Side 2 film away from [illegible] wheel

Side 2 film in contact with [illegible] wheel.

Sub Conference of December 18, 1936

Immersion Subbing of all Safety Cine Products

Mr. Babcock stated that the experiments where C sub had been applied by immersion on Cine Kodak, Cine Safety, and Recordak were all OK for stripping and were being tested for curl by Mr. Klem. As previously reported nitrogen results are 0.08 to 0.09 as compared with 0.04 to 0.0 for the bead method of application. It is felt that these results are well below the underwriters' limits for nitrogen in Safety Base.

In connection with the above, we are noting another experiment in which C sub has been applied by immersion to the OS side of Cine Safety instead of the SS side, in an effort to make the subbing side of all Safety Cine and Cine Kodak products on the OS side. This should save a certain amount of wast due to pan changes. In reviewing the results of this experiment, Dr. Nadeau reported that the important part of the experiment dealing with the proper backing to secure a satisfactory curl, resulted in the use of straight #12 for backing, this being most nearly like the regular product. The stripping and brittleness characteristics were the same a s our present material. The use of the solvent, is open to the objection that it does not contain enough acetone for proper color application in the case of tinting Safety Cine, and also is somewhat questionable in the case of clearing Safety Cine scratches in the base, particularly when the wheel surface is in poor condition. Due to these two objections, and also because the recent subbing of Kodachrome has altered this picture to considerable extent, it was decided not to push this problem any further at the present time until the Kodachrome subbing had become standardized.

Kodachrome

Mr1 Babcock reported that two 10' tests taken from Kodachrome rolls made with cotton-gel sub which show cinch marks, stripping, and general defects, were coated to Recordak emulsion to determine whether or not stripping on this type of product, would be satisfactory. These results will be available next week.

Recent coatings of Kodachrome were then reviewed as follows:

Coating No.	Rolls	Sub	Stripping in Kodachrome Processing Sol.
5259-173	9	x-1000	Bad str. north side due to bad sub flow.
5259-174	3	x-1000	Ok stripping, OK sub flow.
5259-175	8	C sub-Reg	OK stripping, OK sub flow.
5259-176	4	Csub-Reg sub	3 rolls have been tested and are OK, part of coating being held for lines.
5259-177	2	x-1000	One roll has been tested and is OK.

Dr. Nadeau reported that he had the results of their tests with cotton-g[illegible] mixtures that were showing still further improvement from the quality standpoint.

Mr. Wynd exhibited some samples of 35 mm. Kodachrome coated from AP2501 base and subbed with a resin U-coat. The effect of the cracking of the emulsion was noted in these samples in a quantitative manner. The cracking of the emulsion was produced by quickly drawing a loop of the film (emulsion side out) thru two vertical pegs of known distance apart. It was found in these thest that the Kodachrome processed with Kodak standard fish tail punch was IL for emulsion cracking down to 0.16" from peg to peg; whereas Kodachrome made with Bell-Howell perforations show emulsion cracking at 0.3" distances. It was concluded that the Kodak standard fish tail punch was a considerable improvement in this material from the standpoint of emulsion cracking.

Mr. Wells asked Dr. Nadeau about a 500' roll of 35mm. Kodachrome base requested by Mr. Seel, and Dr. Nadeau was to check to see whether this roll was subbed with gelva glyptal or gelva acryloid U-coat. It was stated that Mr. Seel wanted a gelva glyptal U-coat. Dr. Nadeau stated that a 500' roll using a gelva glyptal U-coat would be made on Monday.

Mr. Wynd stated that he was incubating more samples of 35 mm. Kodachrome with both types of perforations for different lengths of time in the original package at 10% R.H. He also stated that their tests including camera test would be run.

Mr. Wynd stated that they were getting back two rolls from New York which would be tested as received and in a RH. room. Mr. Sulzer wants them tested when cold and this will be done on the camera and brittleness tester.

Mr. Wynd recommended that this tester be used for Kodachrome problem on emulsion cracking, and Dr. Nadeau stated that he would get someone to run it.

Mr. Wynd stated that they would start perforation of 35mm. Kodachrome by Kodak standard on Monday morning as per approval sheet coming thru. He also mentioned the wear and tear experiment with gelva glyptal U-coat and Kodak standard perforations made on the Powers machine in which the film actually wore out before it cracked. He stated that he would run the same test with gelva acryloid U-coat on Kodachrome.

A discussion took place on the amount of Kodachrome to be coated on the Roll Coating machines today and it was finally decided to coat 12,000' which could be used along with another 12,000' on hand for the emulsion coatings of today and Monday. An extra 9,000' of base was also located which was being held to examine and which it wasx thought might be available for emulsion coating.

It was decided to include as many stripping tests from Kodachrome rolls in the current coating on the Roll Coating machines, in the regula r Kodachrome coating to take place on Monday night, in order to obtain a more reliable information on stripping tests.

Dr. Eilers stated that we were getting more transference troubbe on gel-cotton subbed Kodachrome than on other types of subbing, and that it was more tacky. Mr. Wells suggested that the knurling be made haavy to overcome this. Dr. Eilers stated that a test was being run where the amount of lubricant was being increased over the dye. Mr. Couch mentioned that some of this transference trouble might be obtained by using saddle trucks to transfer rolls of Kodachrome base at building #29 between the various coatings. He stated that on TB Stripping Film he had noted marks on the rolls which correspond to the lengths of the saddle trucks.

Translite

Mr. Babcock reported that a small sample of Translite base had been coated directly to XRay emulsion both sides. Stripping results were OK on wet test, and "Sp" to "Peels H" on dry test which is passable for this product. Brittleness results were 100% OK at 14% R.H. as campared with 10% for currently produced Safety XRay at this humidity. This method of subbing is apparently similar to the Gevaert method, at least insofar as single sub feature is concerned. Gevaert film has been examined and it has been determined there is no U-coat on this base. The base is very high in brittleness results but stripping ranges from "vsp" to "peels e" on "heaterafter" results. Mr. Wells suggested that a 100' piece of XRay should be run using gelva glyptal sub to see how the sub would behave on XRay base. An attempt will also be made to incorporate blue dye with the mixture. It was reported that sufficient Translite was on hand to last us for another year.

Safety XRay

Mr. Babcock stated that 11 rolls of Safety Xray were made where no hardner was used in the NS gel and that 7 had been coated to emulsion, stripping being solid OK except for one "vsp". Dr. Eilers stated that he had told Mr. Arnold that if he did not desire to go to the use of no hardner on one machine, we could go to 1/8 hardner to be a little safer. He stated that on class #25 using 1/2 the amount of hardner on one side and no NS gel on the other side the same amount of stripping was appearing on both sides which is an indication that the hardner makes no difference. He mentioned that Mr. Arnold was afraid of getting stripping of the emulsion from the NS gel and that we were afraid of stripping of the gel from the C sub.

Mr. Babcock reported that the results of testing on the filtered U-coat samples had beeen finally completed and that stripping, brittleness, flatness, and incubation results were OK on all types of filtration involving the centrifuge, clam shell, and K. Kieffer press. The SER is going thru for the installation of a centrifuge followed by a clam shell filtration.

L.S. Cut SHEET

Dr. Eilers mentioned that one sample of LS Cut Sheet had analysed 0.31% nitrogen. Mr. Babcock stated that this had been checked and found to correspond with high viscosity readings noted on the overflow pipe in the circulating system for U-coat application. This was probably caused by carelessness of the operator in failing to add the required amount of thinner to the U-coat, and a new system has now been set up where one man will handle the thinner addition on all U-coat systems. Under this plan a sample would be delivered at the end of e very trick to be checked for viscosity.

Mr. Wells stated that it was fairly certain we were going to the use of all red or all green dye in Pelloid application on LS Cut Sheet Portrait. He also stated that no dye retention troubles had been found on Portrait with the use of the red dye, this dye apparently not being of the type that is readily absorbed in the sub layer.

Mr. Babcock reported that 5 rolls of old material that showed stripping of the U-coat from the base were being coated over this coming weekend, inasmuch as retests had come thru on this product and a degree of passable stripping was obtained. 10 more rolls of this ma terial are being retested. It is estimated that 75% of it may be recovered for use in either clear gel or red gel coatings. Mr. Wells stated that we should clear up all the old stock before the first of the year or by the end of next week if possible.

The experiment Mr. Scott is running in building #5 on this product to be used for leader stock is to be pushed so that a transfer of unusable material to leaders may be accomplished in t he next few days.

Australian XRay (PSS4Base)

It was stated that an approval sheet was on the way thru which called for 1/4 the standard amount of hardner in the NS gel as used on Australian Cut Sheet XRay, most recent coating of which was started on #48 machine.

London XRay (AP2000)

It was reported that the class 23 type subbing in which the tint was applied over the C sub instead of between C sub and U-coat, was giving good results as far as color line trouble was concerned.

Kotava

Four rolls of Kotava showed bad stripping after resubbing twice, and it was decided to transfer this material to Mr. Dickins. This amounts to around 2,000'.

Kodalith

It was reported that inasmuch as the last coating of Kodalith from #220 machine showed some wet stripping, the stock of Kodalith on hand from #220 machine was being retested and

It was reported there was enough TB base coated to glue on hand to last till the first of March as per the Planning Department. Mr. Couch stated that there is no Kodalith base without glue coating on hand at the present time. Dr. Eilers stated that they could make TB quality on #54 machine in 5 hrs. notice by putting in a sub hopper drive. Mr. Wells said that we should start to make some TB base in January.

Aero

Recently Aero coatings have been showing some "heater-after" stripping troubles. Mr. Babcock asked Dr. Nadeau if he would get some tests underway using a gel-cotton sub combination in an effort to improve the stripping, inasmuch as the solvent combination of the present gel sub being used was so strong that we were on the edge of line trouble after sub a pplication on the dryer. Dr. Nadeau stated that the experiments had been water-boxed and samples were being coated to emulsion.

Film Pack

A discussion on Film Pack sub resulted in the opinion of Mr. Wells that the approval sheet on the way thru proposing the use of Film Pack sub on both Film Pack and NC products, should be brought to the attention of Mr. Seel for his signature.

Formaldehyde in Gel Sub

Mr. Babcock reported on the result of an experiment on Cine Safety, where in one case a single sub had beeen applied, the other case a single sub containing formaldehyde. Both samples were made July 6, 1935, or 17 months ago, and a coating made from each of the above type rolls showed no worse stripping than "vsp". This is another indication that when formaldehyde is used properly in the single sub that aging tests will not result in failure of the sub to hold the emulsion. Incubation tesults will be on hand next week.

Standardizing Gelatin for Sub.

Mr. Bruce states that he can supply us with one grade of gelatin which is the DS type and sell it to us for the same price as the regular types now in use. Such a move would be an improvement from the standpoint of convenience in storage, stability of sub, throwout in sub bead, and combline troubles, at no extra expense to the Roll Coating Department. In addition we would be using a gel of greater purity. It was decided to review the sensitometric and keeping tests in samples of various products that had been put away approximately a year ago, and start an approval sheet to begin the use of this gel on a more exyensive scale.

Recovered #12

Mr. Babcock stated that the iron recently discovered in the recovered #12 solvent was coming thru the solvent line about the middle of November at the same time that yellow color started to appear in the nitrate dope and wondered if the yellow color might be due to the presence of the iron in the solvent.

It was also stated that Mr. Piker found an appreciable amount of copper in the recovered #12, and Mr. Babcock suggested that some tests should be run to discover to what extent this occurred, although Dr. Nadeau expressed the opinion that no appreciable amount of copper would be found. It was decided to have some samples tested to find out about this point.

Mr. Bruce's Glue vs. Gloucester Glue for Stripping Film

Mr. Couch reported that Mr. Bruce's price for glue was about 5 ¢ per lb. higher than the Gloucester price. A year's consumption amounts to 2,000 lbs. and it means it will cost us $100.00 more to go to the use of Mr. Bruce's glue. Due to the fact, however, that Mr. Bruce's glue causes less corrosion in the making kettles and is therefore more convenient to store, it was agreed that an approval sheet should be started to go to the use of Mr. Bruce's glue with the expectation that his price would be lowered if we bought it in larger quantities.

Sub Conference of January 6, 1937

Kodalith

A discussion occurred on the flow lines observed on Kodalith support. These lines run diagonally, and appear to be worse on the side where the sub enters the pan, and can be seen after the sample has been coated to emulsion and developed using light flash. An attempt was made to deliver sub that was made up directly by hand in small 40 lb. crocks. This method, however did not result in the removal of the trouble, and it was agreed that if the glass line in building #45 which delivers to building #20 were washed out the sub might be delivered thru this line at no disadvantage. Mr. Wells suggested that weakening the sub would improve the mottle. It was finally decided that Dr. Nadeau would study this problem and advise what to do.

Hardner in NS Gel

Dr. Eilers stated that Mr. Arnold was still unwilling to sign an approval sheet to eliminate all of the hardner in the NS gel. Dr. Eilers pointed out some tests where XRay made with various amounts of hardner and processed in exhausted hypo at 90F showed wet stripping although all were OK at 85F. The sample with no hardner showed "stre e lee h", 1/4 hardner showed "strs sl", 1/2 hardner showed "strs le h" both sides. Mr. Seel stated that a departmental approval sheet should be started to go to the use of 1/4 hardner on all madhines. He recalled theats made some time ago where rolls containing 1/2 hardner, and held for 6 or 8 weeks and then coated to emulsion showed a greater tendency to blister in exhausted fixing baths than rolls that were made fresh.

Gel for Sub Making

Mr. Babcock raised the question about going to one type of gel for use in sub making, the present arrangement calls for the use of 3 different types, DS of pH5, regular of pH 5.7, and regular of pH 6.0. The reason for 2 different types of regular gel was that when a gel of 5.7 pH was used, it was discovered that less throwout trouble was experienced in the sub hopper on the coating machines. With information now at hand we realize that Mr. Bruce accomplishes the higher pH value of 5.7 and 6.0 by washing our DS type gel for a longer time with Ontario water. During the washing process the gel absorbs alkaline salts from the water and the pH increases. It should be an improvement to eliminate the 2 types of gel washed with Ontario water and use the DS only from the standpoint of sub stability and throwout trouble. An additional advantage would be that this gel could be obtained at no extra cost to us. Mr. Babcock stated that we were at present using it on Jet Cine Kodak, Kodachrome, Kodascope Dup., Recordak, Kodalith, TB Stripping Film, Topographic Aero, Nitrate Portrait, NC, NC film pack, and Safety XRay of the Blue AA type. It was observed by Mr. Seel

that practically everything except Cine Positive, Cine Negative were using this type gel, and he suggested after some discussion that 10 rolls of class #9 Cine Positive be delivered, and that they be brought to the attention of Carver who would include these 10 rolls with an additional 10 rolls subbed with regular gel and make a comparison with a new 5 weeks emulsion quality test recently developed.

Immersion Type Application of C Sub on Cine Safety Products

Tests have now been completed on the application of C sub by immersion on Cine Safety, Cine Kodak, Recordak, corresponding with the old method of applying sub on Cine Kodak for Kodachrome. The nitrogen result showed .04 and .05 for bead application as against .09 by immersion method. It was pointed out that on all of the products noted above, stripping, curl, and 6 day incubation results were OK. We are, therefore, in a position to use this method when desirable. However, due to the fact that Kodachrome is at present being subbed with gel-cotton method, it was decided not to change our present practice of applying by bead until such practice was desirable.

Kodachrome

Dr. Nadeau reported that stripping results were showing satisfactory where the mixed cotton-gel sub was being used. He also stated that Mr. Scott was finding no difference in transference at the present time between mixed cotton-gel sub and the C sub method.

Safety Cine for Cinegraph

Dr. Nadeau inquired about stripping and brittleness results where nitrate U-coat followed by C sub and then by weak gel sub, near the front of the machine, were used on experiments some 2 years ago, and Mr. Babcock showed some results which for the most part showed "vsp" to "OK" for stripping and "Ec/Ec" for brittleness, although one test was solid OK for stripping and "Ec/Ec" for brittleness. It was argued that a good many results were secured that showed solid OK stripping and "Ec/Ec" for brittleness. It was agreed that Mr. Babcock should look up these results.

Chemical #5 (Malonic acid)

Mr. Babcock stated that Mr. Hartman was developing a new method of making chemical #5 by going thru a cyanide process with subsequent hydrolysis, this process to be started in about two weeks. It was agreed to increase our supply of chemical #5 made by the present method so that in case the chemical #5 made by the new method was not satisfactory we would still have the old type product to use. It was agreed to add the information as to percent nitrogen contained in our specifications for Chem.#5.

Testing of Nitrate Uct

Dr. Eilers wondered if there was any way of testing a nitrate Uct for haze before putting it on the machine other than our actual machine run test. He pointed out that 300 or 400 ft. of waste were run on #55 machine during the tests of proposed blends of U-coat. It was pointed out, however, that at least half of this waste was caused by the changing of the pans and that in the balance of the waste 3 proposed blends of cotton were tested out. Mr. Wells suggested trying a test on glass plates, but it was pointed out that when Chemical Plant had coated skins some time ago it was difficult to pick up a difference in haze by this method.

Methyl Cellosolve

Mr. Wells inquired whether the Methyl cellosolve was being used as an improvement for haze lines, and Eilers peplied that it was planned to run 2 rolls of LS cut sheet, to prove out this point. It was noted that the centrifuging of the U-coat and following it by subsequent filtering did improve the haze condition. Dr. Nadeau reported that experiments on F cotton where 11-1/2 % nitrogen was used instead of 11%, and where ethyl alcohol solubility drops to roughly 20%, would give good results from the standpoint of haze, would enable us to use 1/2 to 1 step weaker sub and would be easier to make. He stated that the same range of sub would be possible with this type cotton.

With reference to the fact that high methyl alcohol solubility as shown by testing N510 cotton has shown poor results, Dr. Nadeau reported on nitrate series high methyl alcohol solubility cotton which had been given a cold wash that good results were obtained. Inasmuch as the N510 cotton was a hot washed cotton, the temperature of the washing might be the answer to this question instead of the methyl alcohol solubility, and this is to be investigated further.

Heating Coils for Solvent in Sub Making

Mr. Babcock reported that the installation of the heating coils at building #45 was now finished and that we would shortly be able to control the temperature of the solvent that is used in sub making. He pointed out, however, that considerable inconvenience resulted from having to call Kodak West each time it was desired to pump a batch of solvent and it was suggested that a Remote Control method of starting the pump at Kodak West be installed. The control should be located in building #45. It was suggested that this matter be taken up with Mr. Couch.

Aero

Dr. Nadeau reported in general that the subbing experiments on Nitrate Aero were worse than the check, which latter were solid OK. He stated that they were coating another set of these experiments on #56 machine which were a variation of the two subs which looked the best on the previous set. He also suggested that it would be possible to apply a C sub at the 4th hopper, followed by gel sub at the 1st hopper place if the stripping trouble persisted. Mr. Wells stated that all the Aero would be made on N510 base instead of RP in October. He stated that if we could get a machine in Bldg. #21 for Aero that #46 machine would be used for Cut Sheet. Mr. Babcock

reported that stripping on Aero was coming better since the regular sub was run faster thru the hopper.

NC for Film Pack

In regard to the approval to use the Film Pack type sub on NC support for the sake of uniformity of this product, Mr. Seel asked two questions; namely, (1) if we ever had blister trouble on NC similar to that found on old type Film Pack. This matter was discussed and it was agreed that we have had blister trouble on NC support with the use of the old type method. (2) Is the stripping passable on NC support with the use of the present type Film Pack sub using 80% stock. This question will be answered after two or three coatings recently produced on NC and Film Pack have had stripping results carefully compared by Mr. Rupert. These coatings should be coming thru in another week.

TB

Mr. Couch reported that the TB Film was being glue coated in building #29 and it was desirable to combine the glue and dope coating operation in the Roll Coating Dept., if possible. The trouble encountered in the past is high stripping time. Recently a C sub application on top of the Kodalith cuts down the stripping time, to a point comparable with B-29's coating. Mr. Wells suggested that the gel sub applied on Kodalith on the coating machine could be omitted and the glue applied on the unsubbed base. Mr. Couch replied that Safety Cine Positive experiments had been put thru with this in mind. Mr. Couch stated that it was necessary to make 15,000ft of TB base at the present time to fill recent order. It was decided to make this on #53 machine. Mr. Couch suggested that a piece of Dental XRay is to be used for TB Stripping Film Experiment. Mr. Wells suggested that we include a piece of unsubbed Kodalith with this test.

GSB:S

Sub Conference of January 15, 1937

New Type Subbing for Kodalith

Mr. Seel opened a discussion regarding the new type of subbing pans that are now being used on Kodalith product, and resulting in a better application of sub, inasmuch as sub streaks are practically eliminated after the emulsion coating. This new type pan is a modification of the present 4" pan now in use. The new feature being that a strip of nickel is bended in a semi-circular fashion and attached to the inside end of the cup, thereby creating a separate compartment in the middle of the pan. The sub is delivered to this separate compartment underneath the surface and on the down side of the roll. The overflow is taken from the opposite end on the up side of the roll and is conducted outside the machine by rubber tubing. The only fuhction, therefore, of the standard pan is to support the cups.

Dr. Eilers stated that one of these pans had run for 36 hours before being changed as against 12 hours for the standard type. This would be a big improvement in waste if this performance could be maintained. Dr. Carver remarked that this sub streak trouble might be similar to trouble experienced some time ago which gave rise to some experiments in which a rubber squeegee was allowed to come against and underneath the surface of the roll in the sub hopper. This squeegee action removed the lines which previously could be noted on the top surface of the roll.

Mr. Seel stated that he would be interested in closing up the space between the bended nickel and the support, this resulting in a hopper containing a very small amount of sub. Mr. VanDerhoef stated that we could go as close as 1/8 of an inch if the pans were made carefully. Mr. Babcock pointed out that capillarity might influence the results if the nickel were brought too close to the surface of the support.

Mr. Seel suggested that Mr. Lankes could go into the study of this hopper and Mr. Lankes was claaed into the Sub Meeting for the purpose of listening to the discussion. Mr. Seel suggested that some concentrated dye solution could be used in the study of this problem. It would not be necessary to use nickel in the experimental pan, but brass, tin, or copper with solder would be satisfactory, and would be less expensive as well as hastening the investigation. Mr. Seel requested Mr. Lankes to spend as much time as possible on this pan at the present, inasmuch as it was extremely important in the production of a good grade of Kodalith base.

It was decided to try the new type pans on #53 machine to see whether it would make satisfactory rupport for T.B. Mr. Couch stated that he needed only 10 rolls of this product at present.

which need not be produced until the first of March. Mr. Seel then suggested that we hold off on T.B. production and run all Kodalith. It was decided to have the mechanics work over the weekend to produce four more new type pans with an extra two for spares. Mr. Seel stated that recent Kodalith coating was worse for mottle. Dr. Kilers stated that this was a 10,000' coating of which only 3,000' was made by the improved method.(new type pans)

Mr. Babcock stated that since the wood pulp acetate has been removed from the Kodalith system we had been able to decrease the strength of the sub 2 points. Mr. Wells stated that the Chemical Plant wished to go back to the use of the wood pulp, which would result in a considerable saving of money, and he suggested running a big stock of Kodalith.

Pumps

Mr. Wells asked how we stood on the circulating pump question. Mr. Babcock stated that it was necessary to use about 2,000 lbs. of U-coat per day per machine without the pumps and the circulating system. If the pumps could be supplied this consumption would be cut in half, resulting in a large saving of money. Mr. Seel stated that it would not be necessary to wait for nickel pumps for this job and that steel pumps would be satisfactory. Inasmuch as it was felt that the cost of installing steel pumps, at $56.00 per unit, would be less than the waste of the U-coat during the time that the nickel pumps would take to arrive, it was decided to go ahead with this job using steel reciprocating pumps. Mr. Seel stated that Mr. Couch shouldget into the question of circulation in the application of paper subs as soon as possible.

L.S.Cut Sheet

Mr. Babcock showed a sample of AP2000 LS which had been made with methyl cellosolve solvents in the Nitrate U-coat, and it was agreed that the haze was much improved by this process. Stripping results on these rolls were all passable; in one instance showing "lp". It was ascertained that this stripping occurred between the U-coat and the base. Dr. Carver stated that inasmuch as it would be some time before we would be able to go to the use of methyl cellosolve that we should rush any experiments desirable with it.

Mr. Babcock stated that we had more stripping on #32 machine last week, this machine being worse than 31 and 33 machines. Dr. Kilers stated that changes had been made in the air circulation since the installation of the new fans which was probably responsible for this trouble. He stated that an improvement in stripping was being noted at the present time since the gate settings had been changed.

Hardner in N.S.Cel — Formalin solution

The experiments using 1/2 the amount and zero amount of hardner to be aged monthly to a period of up to 5 months are under way and they will be concluded on March 6.

Dr. Kilers stated that the approval sheet to use 1/4 hardner in the XRay was in Mr. Arnold's office, but had not as yet been signed by him. It was agreed to try to hurry this along.

C O

Gel for Sub Making

Mr. Babcock stated that 10 rolls of class #9 Cine Positive requested from a previous week's sub meeting had been delivered and that they were better for combines than the regular cla ss #9 product. Stripping and brittleness were being tested. 10 additional rolls usi ng regular gel in the sub a re being coated at the present time to b e used for checks. When these rolls are finished and tested they will be referred to Dr. Carver to be emulsion coated and processed by his 5 weeks' aging test.

Mr. Babcock stated that the first 12,000' of Kodachrome recently made with gel-cotton sub showed no worse than "vsp" stripping. A discussion ensued regarding the cause of yellow stain which appeared to be worse on the Kodachrome using C sub and one applica-tion of gel than when C sub and 2 applications of gel sub were used. It was stated that if the yellow stain was a dye retention phenom-enon that the extra regular sub application should theoretically result in an improvement. It was agreed to look up the status of older coatings where C sub was used, both with one and two appli-cations of regular sub, to see whether any difference could be noted in yellow stain. It was also decided to find out if B-29 gel U-coat was applied on these coatings.

Safety Cine for Cinegraph

Mr. Babcock reported that he had looked up some old data on dope experiments where Nitrate U-coat followed by C-sub and regular sub had been used, and that 26 results were found where solid OK stripping and "Ec/Ec" brittleness was reported. These tests were coated to Cine Positive emulsion and were made for the most part on AP2500 dope.

Heating System for Solvents

It was stated that the heating system had been started up this week in an experiment to test the warming of solvents for our subs. Mr. Babcock stated that it would be impossible to deliver regular subs and U-coats with our present apparatus due to the inconvenience in making phone calls to K.P.West, 50 calls being required per day. It was possible, however, to deliver U-coat and C-sub when properly heated solvent is used at the present time and this is being started. In an actual test the U-coat tem-perature received at building #20 was 86F, the U-coat increasing to 91F. as it flowed down the nickel line in the hallway to 31 machine. Temperature of the pans themselves were 88Fto 92F.

Sub Conference of January 22, 1937

Mr. Babcock stated that the stripping on 32 machine was still worse than on 31 and 33 machines during the past week, this in spite of the fact that the U-coat had been heated to machine temperature before application. Also an excessive amount of U-ct has been used up at the present time due to the fact that circulating systems have been temporarily outlawed. It is known that high rate of U-ct flow results in better appearing product which should also be better for stripping. Comparison was then made of the threadup of 32 as compared with 31 and 33 machines, and it was noted that the support was considerable better cured on the OS on 32 machine before receiving the U-ct than on 33 and 31 machines, and it was generally felt that if the threadup on 32 machine was changed to correspond more closely to that on 31 and 33 that U-ct stripping from the base would be decreased. Dr. Nadeau pointed out that if we want to coat Portrait thickness Kodachrome, it will be necessary to revert to the present threadup. However, it was felt that enough of this product had been coated to last for some time, and that we could safely depend on a very large run with the new threadup.

It was generally agreed that air condition played an important part in stripping on this type machine, and the possibility of getting an instrument to measure the amount of air flowing thru the air section was discussed.

Mr. Babcock reported that the rolls made where the Methyl cellosolve was used in the U-ct were being coated to emulsion, and that flatness, cur, incubation, and keeping tests will be run.

Rolls of L.S. held for stripping, when retested, are currently showing that 12 out of 18 are coming passable.

Heating System for Solvents.

The heating system is still operating on U-coat and C-subs and results to date have been very satisfactory. U-coat temperature in the storage tank in building #20 is being maintained at 80 to 85F. If the temperature goes below 80F the loss in heat will be compensated for in building #45 by warming up the solvents still more.

It was further agreed that the a uxilliary heater to be installed in building #21's outlet of the storage tank would be a further safeguard so that we could be sure that small fluctuation in the U-coat temperature could be properly taken care of, and this job is to be rushed. Dr. Nadeau stated there would be an advantage in running the U-coat thru the inside of the coil from the standpoint of better mixing and agitation than if the U-ct ware passed outside the coil.

Gel for Sub Making

Mr. Babcock has written to Dr. Carver and given him the list of the 10 rolls of Cine Positive class #9 made with D. S. Gel in the sub, Carver to arrange to have 5 week testing done. These rolls were OK for stripping and brittleness on tests.

Dr. Eilers suggested that inasmuch as D.S. gel was being used on Cine Kodak, Recordak, and Kodachrome, that we should also use it on Safety Cine Positive, and it was agreed to take steps to start an approval sheet for this.

Mr. Babcock showed samples of sub solution taken from the Cine Negative sub crock that had stood overnight,. In the case of the regular sub where regular gel was used a fine precipitation of gel could be noted. However, in the other sample of sub made with D.S. gel, no precipitation was noted whatever. The precipitate was concentrated and when diluted with hot water showed complete solution, and was assumed to be gelatin.. We have also noted recently that Cine Negative machines in building #53 have been showing some dirt trouble originating from white specks, and it was felt that some of this trouble might be coming from the sub. It was agreed to have one roll of Cine Negative made in building #53 using D.S. gel in the sub. It was pointed out that it was standard practice to use D.S. gel on Safety XRay, inas much as this had been a standard in the coating of Blue AA.

Safety XRAY

Dr. Nadeau reported that the Blue AA tests were about to be emulsion coated and the support would be on hand Monday for testing. Mr. Babcock stated that it was now possible to make up Blue AA type using glyptal and blue tint without trouble from precipitation. This is accomplished by adding blue tint to the sub and stirring in well before the glyptal is added.

It was reported that all of the XRay machines were using 1/4 hardner only in the NS gel application on this date.

Dr. Eilers reported that we were getting into more "rabbit track" trouble at the present time than we have been having. In the case of class #21, rabbit tracks appear on #1 emulsion coat, whereas on class #25 the trouble was appearing on ~~back~~ #2 side. Since the support is reversed at building #29 in coating to XRay emulsion, the result of the above statement means in both cases that the trouble is found on the SS side, which is the side on which tint and NS gel U-coat are applied in each case.

The composition of the NS gel U-coat was discussed, and it was decided to run one roll in which #220 type spreader was added to the gel U-coat in same quantity formerly used in our NS gel U-coat when delivered from building #30.

Dr. Eilers mentioned that Mr. Beach of building #30 had a spot test to show the spreading power of NS gel solution, and Mr. Babcock inquired if it would be a good idea to work out a test and include it in our specification for gels.

Safety Portrait Thin Base

A piece of thin Cadalith support was coated Portrait gel and emulsion to see whether stripping results would be passable in the event that we decided to use this type of base for inexpensive type portrait. Results were as follows:

220-6739 Pcs OK Pcs - Gel
OK OK OK - Emul.

Dr. Nadeau stated that we should get flatness, curl, buckles, and incubation results.

Kodachrome

Mr. Babcock reported that stripping results were coming OK for Kodachrome where gel cotton sub was being used. Dr. Nadeau stated that he hoped to be able to change the subbing of Kodachrome in the near future to mixed gelatin-Santolite type. Incubation results were now being run. He stated that the use of Santolite M.H. with gelatin gave somewhat better stripping results than with the gel cotton combination without being any more brittle.

Dr. Eilers stated that an order of 2,000 ft. of 35 mm. AP2501 Kodachrome for Bantam had been received, and Nadeau stated the gelva glyptal type of sub should be used for this production and that it should not be made until the camera test had been viewed. It was suggested that the present stock of AP2501 on hand should be sent out to be recovered or transferred to Mr. Brooks for experiments, and it was felt that Mr. Seel should decide this point.

The question of residual gel stain in the 16 mm. Kodachrome for C-sub and gel sub was brought up. Mr. Babcock stated that there did not seem to be any difference in gel stain when one or two gel subs were used over the C sub. Nadeau reported that the gel U-coat applied at building #29 was responsible for the yellow stain.

Dr. Eilers reported that transference trouble in the gel-cotton sub had improved with the increase of the thickness of the knurled edges. Mr. Seel thought that the knurls were too deep at the present time and asked Eilers to make a suitable reduction.

N.C. Film Pack

The question of a common sub for NC and NC-Film Pack was brought up by Mr. Babcock and it was stated that Mr. Seel had two questions to ask in connection with the proposed sub. #1. Is the stripping of Film Pack base coated to NC emulsion as good as the stripping of NC base coated to NC emulsion. Mr. Rupert has answered that question in four letters, in which four coatings were made where NC and Film Pack support were alternated and the whole coated to NC gel and emulsion. Mr. Rupert reported that stripping was OK thruout. #2 Have we ever had blister trouble on NC similar to that found on old type Film Pack. It was the consensus of opinion that we have always had more or less trouble with blisters on NC product. It was also noted that building #29 have an approval sheet to draw from the stock of Film Pack base when necessary to supply their wants for N.C. It was therefore, felt that we were justified in resubmitting the approval sheet for Mr. Seel's approval.

Aero

Dr. Nadeau reported that samples subbed with C sub and gel sub were better in all respects than the single nitrate sub had been. Mr. Babcock stated that this process of first applying the C sub on Aero had been previously used on Wash Off Relief Type of base with success. Dr. Nadeau stated that the thought we would soon be able to make a couple of rolls of Aero where C sub is used. Mr. Babcock stated that the stripping on Aero was better with the gel sub since the rate of flow had been raised.

Sub Applications at Various Speeds

Mr. Babcock again brought up the point of running the support at different speeds 300, 500, 900, 1200, etc. for the purpose of being able to show a saving in the amount of gel used in Roll Coating Dept. by diminishing the amount of stock added to certain subs that were applied at higher machine speed. This work should be undertaken on an experimental machine where it would be possible to accurately measure the sub deposited on the support. Dr. Nadeau reported that he had turned this problem over to Pleger who was planning to do some work which corresponds with the above.

Sub Conference of February 5, 1937

Safety XRay

Some Blue AA tests have been run where encouraging results were secured on stripping and brittleness. Another set showed wet stripping trouble, and further tests are being temporarily delayed pending a review of this situation.

Stripping results on regular Safety Xray continue to be coming OK.

Mr. Wells reported that a complaint on brittleness had been received from London, on XRay which Eilers stated was coated last October, FFG sub on one side and FG on the other. He noted at the present time that wer were using GH on both sides, and that brittleness test would be taken.

Mr. Wells stated that the Film Planning wishes to shut down two Portrait machines because waste has been low and speeds high. He suggested that before the shutdown a sample of XRay should be coated putting NS gel on, stating that it might be possible to make AP XRay base for one locality where a good flat sheet could be obtained. In the coating of this roll , he suggested that Uots should be applied at 7 and 8 preferably on #33 machine, after which gel sub could be applied, containing tint, at 5 and 6 hopper places, and NS gel at 3rd and 4th hopper places. Eilers stated there would be some question as to whether or not sufficient curing would be obtained. Mr. Babcock pointed out that 60 ft. more of curing after the support had passed thru the 3rd hopper, could be obtained on #33 than on 31 and 32.

Eilers reported that no rabbit tracks had been noted on XRay during the past week. He stated that it was the opinion at building #30 that the NS gel differs very much in their spreading ability, but he stated that Dr. Carlton had measured this defect for emulsion thickness and found scarcely any difference in the thickness in or out of the track, which statement would lead us to believe that this trouble is something different from the spread. He stated that one roll of base coated with 220 type spreader in the NS gel Uot had been coated to emulsion and that no rabbit tracks were found, and that 5 more rolls were on the way thru. (47-3056 to 3060). He also stated that the batch of NS gel used in making up NS gel solution had been changed in the above 5 rolls as well as in regular production.

Mr. Babcock gave results on percent ash in two batches of NS gel as follows:

Batch 1825 formerly being used	1.82%
Batch 1826 now being used	1.79%

It was noted that the percent ash in NS gels was considerably higher than in subbing gels. He stated that samples of 4 NS gels had

been sent to Mr. Beach of Bldg. #29 to be tested for spreading with a spot test, and that hardly any difference in any of the gels could be picked up, the difference, if any being in favor of batch 1825. Gels tested were 1825, 1826, 1834, and 1870.

Eilers reported that only about 1% of the current rolls were being held for rabbit tracks, where formerly 30% had been held.

He also stated that the new shallow pans had been tried in applying Uct, but diagonal lines and bubbles in the bead were experienced. He explained that it would be necessary to effect better distribution of the sub in order to correct this. Mr. Babcock stated that in order to filter out bubbles and slugs in the Uct, that a perforated tube was run the whole length of the pan over which a filter of bolting silk was attached.

It was reported thatthree rolls of London Xray had been held because of stripping.

L.S. Cut Sheet

Mr. Wells stated that Messrs. Gunderson, and Hoag reported that 25,000 ft. of old 3 process LS Portrait was still on hand to finish processing. It was suggested that this processing could be done on # 31 and 32 machines although there was a possibility of some wast in this proposal. It was agreed to try one roll processing one time over the machine and applying gel sub in rear of the machine.

Mr. Babcock reported on a set of tests of LS Cut Sheet where every other test was reversed in the test roll . On every reversed test, the dy retention was worse, it being the SS side that received the green pelloid. This shows that standard method of production where Pelloid is coated to OS side is the best way. It was agreed that the chances were the gel sub could be weakened without gettin into stripping, and thereby improving dye retention.

It was noted that most of the current stripping on LS was of the type where Uct separates from the base. Mr. Babcock reported that the rolls using Me. Cel. in the Uct show a definite improvement in haze and lines, and that stripping was good. Tests are now going thru for flatness, curl, incubation, and keeping. Eilers stated that an approval sheet had been sent thru to Mr. Seel for permission to go to the use of Me. cell. in Ucts. He stated that 5 or 6 preliminary tests had already been run where methyl cellosolve was used in the Uct, and that Mr. Klem had haze, flatness, curl, incubation, and keaping tests as a background for the two rolls above noted.

Mr. Babcock stated that no stripping had been noted on #32 machine since the threadup had been changed to correspong with 31 machine. Some changes have also been made on air circulation. This is a definite step forward since 32 machine has been the worst offender on stripping.

Eilers stated that since 33 machine was running high speed of 315 ft. per 1-1/2 hrs. it might be possible to use regular amount of

stock in the sub instead of 2x regular amount as has been past practise. He stated this should improve some line trouble being experienced on the LS base. It was pointed out that such a move might harm the dye retention properties as well as getting us into diagonal dot trouble. It was suggested that DS gel with 2 x stock might improve the line trouble. Dr. Eilers thought another possibility would be to go back to the immersion method of applying the gel sub which might result in more even application. Mr. Babcock reported that bloom trouble was secured when this was done, and Mr. Wells stated that the new shallow type immersion pan might get us out of this trouble. If successful this would make it inneccessary for building #29 to use gel Uct in coating up some of our Portrait base. Mr. Babcock stated that experiments being run by Dr. Pleger on the amount of gel sub applied at different speeds should be of help in cutting down the amount of stock in experiments to be run.

Mr. Babcock reported that 15 rolls of LS Cut Sheet which were held because of stripping, had been retested and that 12 camd e thru passable. There are now only 4 or 5 rolls left to be retested, and these are all less than 2 weeks old.

Kodachrome

Mr. Babcock reported that Kodachrome stripping was still coming very good where Gel-cotton sub was being used, no results worse than Vsp being obtained. He noted Dr. Nadeau's recent report on 3 weeks Tropical Incubation of Kodachrome in which gel-cotton sub gave better stripping results than C sub and regular sub. He also stated that the gel-cotton method of subbing Kodachrome gave less brittleness than did the C sub and gel sub combination.

DS Gel

Mr. Babcock stated that an approval sheet had been started for the use of DS Gel in the sub on Cine Safety. As previously noted in this report DS Gel experiments on LS Cut Sheel will also be run.

Mr. Babcock stated that we had an approval to use the DS Gel in XRay subs and that 5 rolls are geing coated and tested to be sure that conditions are OK for this change. He stated that Mr. Bruce had been informed that 75% of our subbing gels will be of the DS type by the end of this year.

Two 1000 ft. rolls of Cine Negative where DS gel was used in the K115 sp. sub have been made on 215-7114, and 215-7115. A comp plete set of keeping tests has been ordered on these rolls thru Klem.

Kodalith

A 100 ft. piece of wide Kodalith is being coated to green gel and Portrait emulsion and is to be tested for flatness, buckle, curl, and incubation. Previous experiments show passable stripping and OK dye retention. The purpose of this expt. is to test the possibility of using a cheaper base for special Portrait orders.

Some gel stripping has been reported on the Pelloid coating of Kodalith. After the emulsion had been applied the rolls were passable with one or two exceptions. Mr. Babcock noted that acetate made from wood pulp was increased in this system and may be responsible for this trouble, and that sub should be tightened up. (strengthened up)

T.B.

Mr. Couch suggested that D.S. Gel should be used in the manufacture of T.B. Stripping film during the processing on the paper machine. After some discussion it was decided to send thru an approval sheet requesting for this change to b e made. Mr. Couch stated that we have gel throwout trouble in the sub when regular subbing gel is used. In the meantine, it was decided to make no change in subbing method during present production which amounts to approximately 60,000 ft. Mr. Couch mentioned that with lower dryer temperature on 53 machine, we can make T.B. support in one operation, and these samples are coming thru during the following week. He also mentioned that when a roll of T, B. base was coated on 53 machine applying sub with bead hopper, the glue always slipped off, probably due to high temperature curing on 53 machine. It was decided to run an experiment with 200 F. temp. dryers on 53 machine and use C sub. Mr. Couch also mentioned that lower temperature dryers would improve the static situation on T. B.

Yellow Nitrate Base

Mr. Babcock exhibited some samples of nitrate base which had been dipped in various sub combinations after which sub was dried at 120F and the samples heated in an oven at 240F for a period of two hours. As a result of this examination it was shown that when chemical #1 came in contact with nitrate support, it had a tendency to produce a decided yellow color after being heated, this yellow color progressively increasing as the percent of the dchemical #1 was increased in the solution applied. When chemical #2 and chemical #5 were used, however, in the same fashiin as above no yellow color occurred. Hadman asked for a sample of the chemical #1 to see if it would show any yellowing by itself when heated on a glass plate for a period of two hours at 240C. Mr. Babcock suggested that the next time yellow color appeared on the nitrate support that an experiment should be tried where #2 and #5 chemicals were used in the regular sub in place of chemical #1 to see if this substitution would improve the yellow color.

Sulphur Free Rubber In Sub Bottles

Owing to the breakage of the glass bottles where plaster of Paris was used, it was stated that sulphur free rubber stoppers were being tried again in sub bottles for regular sub. If sub line trouble is experienced, the rubber stoppers will be replaced with plaster of paris. Further suggestions for replacing glass bottles included metal containers with sight glass, third stage glyptal, etc, and it was agreed that glass was superior.

Centrifuge

Eilers inquired about the centrifuging of Uct solution and stated that some complaints had been received on the rough appearance of the XRay which might be due to the Uct. Mr. Babcock stated this estimate was being finally revised and will be ready for presentation next week.

Haze

In connection with haze Dr. Nadeau stated he had made some tests using the new type F cotton which is featured by higher nitrogen content and that complete set of tests had been arranged for, which if successful would enable us to change over to this type of cotton and therefore improve haze condition.

Resubbing

Mr. Babcock stated that 3 rolls of Cine Kodak showing bad stripping after testing and retesting were to be resubbed. Mr. Wells stated that inferior product such as the above should be cleaned up promptly in order to avoid obsolete stock.

N. S. Gel

A new batch of NS gel 1870 has been received which has been made up into NS gel and 47-3074, 1000' has been delivered. Incubation tests are to be run on this roll to check theenew gel.

Circulating System

Circulating systems with the new type reciprocating pumps have been started up again on 31, 32, and 33 machines and wex are planning to start on 50 machine coating Safety Xray at an early date.

Heater for Nitrate Uct.

Mr. Babcock reported that the sketch had been approved for installation of a hot water heater for nitrate Uct, and that work on this installlation should progress rapidly.

Brittleness

Mr. Babcock reported that brittleness on Cine Positive Nit. has improved, only one roll showing brittle result during the past week.

Eastman Wash Off Relief

Dr. Nadeau inquired whether there was any particular reason for the application of a solvent backing on Eastman W.O.R., and the only reason for this application appeared to be for curl regulation. However, since this product is waterboxed, Dr. Nadeau felt that the solvent backing could be omitted, and it was agreed to run one short roll without backing of solvent application to prove this point.

GSB Emil is on without backing application of solvent but the support shows many scratches. This solution was applied to

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Sub Conference of February 12, 1937

XRay

In connection with the complaint from the trade on brittleness of Safety Xray mentioned in last week's report, it was noted that brittleness comparisons on 51-178 and 197 as against our recent product indicated that the recent product was running slightly better. It was considered that if the sub were weakened still further to improve briggleness at this time we would be in danger of wet stripping, and inasmuch as the product made at the present time would be available for use in the spring time when humidity was higher, it was agreed to go ahead as we are at the present time, inasmuch as only one complaint on brittleness has been made. It was noted that we could not apply a heavier nitrate Uct than we are at the present time because our percent nitrogen results are in the upper range.

It was noted that circulating system on #50 machine was about ready to start on Uct application. It was estimated that by March 1, the nickel pumps would be in, and we would then extend circulation systems to 47, 48, 49 and 55 machines.

Eilers reported that Mr. Rittenhouse finds that if class 21 made with 2 NS Ucts is coated same as class #25 (with one NS Uct only), that no trouble from curl is experienced. In the class #25 type of coating, building #29 applies #1 coat to the OS side. Mr. Wells then suggested that it would be well to start coating Class #25 on another machine. Nadeau reported that Mr. Paddock could see nothing wrong with such a move, and that several things were in favor in moving over to class #25 type. It was decided to try and make some progress in changing over some of the class #21 machines to class #25 type, and 47 machine was to be the first one changed over.

In connection with a flatter type of XRay Mr. Babcock mentioned 200 ft. experiment which was to be run on #33 machine to be coated to XRay emulsion in which Uct was applied in front of the machine and this followed by regular sub containing tint, and finallly two NS gel applications at the rear end. This experiment was to be run on the startup of 33 machine. Nadeau stated that there would be insufficient curing on this type of machine for such an experiment. However, Mr. Wells stated that before spending $5,000 for an air tower, he would like to see this experiment run in order to make sure we could deliver a flat type of XRay from machine as is. Eilers suggested that it might be possible to work out a process of putting on a regular gel with color on one side and NS gel that would stick to the base on the opposite side. This would eliminate two hoppers giving us a product of class #25 type which could have more curing on #33 machine. It was finally agredd that Nadeau and Eilers would look up all the information on this problem and coat 5 or 6 experiments with the above noted 200 ft. piece.

In connection with the above discussion, Nadeau mentioned that Mr. Seel thought if we went to XRay on AP2000 dope that we would get as good brittleness as we do on PSS4. It was agreed that some difficulty might be experienced to overcome this condition, since it was the general feeling of those present that there was more brittleness in the subbing of AP2000 than of the PSS4 dope, and that the brittleness differentiation is not all due to the Portrait emulsion at building #29 as it is with the XRay emulsion.

Wells stated he would like to make a PSS4 coating on #33 machine and that Dope Department would not advise running a line. He thought it might be worth while to bring in a tank of dope for the test.

In connection with rabbit tracks, it was reported that the coating of 5 full rolls using 220 type spreader had been made and examination discloses that no rabbit tracks were present. However, 4 of the 5 rolls are held for dirt. It was also noted that 220 type spreader was only good for 8 hrs., being an chemically unstable treated bark expract, and the general opinion at the meeting was we should defer the use of this spreader unless we were forced to go to it by rabbit track trouble in the future. Mr. Couch suggested #79 spreader which he used in Stripping Film glues, and it was decided to try and incorporate this material in NS gel and if successful to coat one roll. It was agred that since we were not bothered particularly with rabbit tracks at this time that experiments on a broader scale would be pushed.

Babcock reported the receipt of a new batch of NS Gel #1870. This has been checked by Mr. Beach for spreading and he has reported it OK. One roll has been coated and if incubation tests are OK on this one roll, 5 more rolls will be coated and incubation tests taken again. If these show OK, we will accept the gel for use.

Babcock reported that 5 rolls of XRay using DS gel in the sub had been made and coated to emulsion , and that stripping was OK, brittleness the same as checks, and a atatic test run in building #29 and reported on by Mr. S. Wells was OK. It was noted that it has been standard procedure to use DS gel in the past on blue AA product, and the above 5 rolls were run as a precautionary measure before entering into the use of DS gel on nitrate Uctd Xray, and it was decided to start an approval sheet for one XRay machine to go to the use of DS gel in the regular sub.

The application of nitrate Uct with a shallow pan was discussed and Nadeau reported that as soon as his apparatus in builing #19 on immersion drum was completed a further study would be made.

Nickel Line and Fittings for Nitrate Ucoat and C sub.

Mr. Babcock noted that for some years we have been delivering Uct and C sub from building #45 to building #20 thru a brass line, and that several unsuccessful efforts have been made to replace this brass line and the fittings with nickel but that nothing had been accomplished due to the great expense of the nickel installation. Recently, however, we have actually taken a piece of the brass line out and some of the sediment in the line collected and delivered to Mr. P. Bahr to observe the effect in an XRay coating.

The aging experiments on pairs of XRay rolls one with and one without hardner, to be taken at monthly intervals for a period of three months will be completed about the middle of March. A pair of folls has been delivered during the past week. These rolls are to be compared for blister trouble.

Safety Meeting

It was noted that Mr. Armstrong had called a safety meeting to discuss improved handling of sub. Mr. Armstrong also wishes to have the motors and wiring brought up to date in all machines in buildings #20 and 21. This meeting was held on Thursday, February 16, and it was noted that if improvements could be made in sub handling that the present wiring might be adequate for a while longer. Mr. Seel had in mind a long enclosed corridor in which the subs might be stored, the corridor being well ventilated with plenty of air going thru to prevent explosive vapor.

Kodalith

Mr. Seel asked about stripping on Kodalith film, and Eilers reported that stripping was satisfactory since sub strength had been increased back to the point where it was at the time wood pulp acetate was run. With reference to the lines in this product Eilers stated that they actually originated in the dope coming off the wheel, and stated that the wheel on #54 machine would be buffed to see if this condition could be improved. In connection with the improvement of lines on Kodalith base, it was felt that if wood pulp acetate could be eliminated from the Kodalith dope a weaker sub could be used and the liney condition would be improved. A discussion was then started as to the possibility of using a separate system for Kodalith where the wood pulp acetate would be left out. It was decided in any case the wood pulp should be dropped out of PSS4 dope used in Kodalith to improve lines.

Mr. Seel suggested that possibly a wax, such as ski wax might be added to the tope to make it leave the wheel more easily and thereby avoid troublesome lines. He also mentioned castor oil. He warned against the use of paraffin wax, and recalled the incident some years ~~ago~~ ago where paraffin wax became mixed with nitrate scrap and resulted in a dope which would not cure out properly. He suggested to Dr. Carver that it might be well to try an experiment where #99 wheel was waxed. Carver suggested stearic acid, Nadeau suggested tallow, and Babcock suggested Nujol.

Cine Negative *See Experiment by Stark with fatty alcohol sulfates - Nacconol etc.*

On preliminary coatings of two 1000 ft. rolls of Cine Neg. which had been coated to emulsion, incubation testwaare as follows:

			0	3DAY
215-7114	Exp.	1227-293-13	.05	.08
215-7115	Exp.	1227-295-51 to 53		
215-7057	Chk.	1227-293-18	.05	.09

It was finally agreed that it might be possible to establish a standard on the Lab. coating machine. Nadeau stated the centrifuging of the Uct would not help this type of haze but would help general roughness in the Uct application. Babcock mentioned the new type F cotton as a probable aid to haze, and Nadeau stated that he had both Cine Safety and XRay experiments being tested for stripping, brittleness, curl and incubation. He thought that by the first of March we would have results on incubation and curl of XRay.

Three Process LS

Babcock mentioned 25,000 ft. of three process LS stock still on hand and stated that it had been agreed to process one of these rolls on 31 and 32 machine, and this work is to be done after these machines were down.

Brittleness Complaint on LS

It was noted that a complaint had been received from the trade because of brittleness on LS Cut Sheet. This roll was coated to emulsion last year during the period when we had UCt stripping from the base, and a strong regular sub was being applied at this time. Brittleness tests have been taken , and results were "0,0,0,0" for the complaint, whereas recently brittleness results had been showing "40,10,20,10". At the same time the recent sub being used is somewhat weaker than was used when the subject of the complaint was coated, and we believe that brittleness results are, therefore, somewhat better than they were.

The proposed experiment where various reductions in the amount of gel used on the LS Cut Sheet because of higher speeds are to be run in the near future. Eilers pointed out that when we change from FG200 to FG on Safety Cine the comblines situation is considerably improved. A similar change on LS Cut Sheet should also improve the situation and possibly make it unnecessary for building #29 to apply a Uct because of liney condition. Nadeau cautioned that the dye retention properties are better with greater amounts of gel, and that we should watch this point carefully in the future experiments.

T.B. Stripping Film

Mr. Couch mentioned some chatter trouble they were having with sub hopper lubrication when Nujol was used in the packing and wondered if it would be OK to go th the use of Merco lubricant. Mr. P. Bahr replied that we changed from Merco lubricant to Nujol some months back when we were in sub line trouble and if sub lines were satisfactory on T. B. Stripping Film he could see no reason why the Merco lubricant could not be tried. It was suggested that one roll should be run and after tests had been secured and found to be OK several more rolls could be run and the effect on chatter noted in the coating of this roll. Mr. Wells suggested the use of the new roller bearing hopper, and it was agreed to run one roll using this type hopper and if tests came OK to run several and observe the effect on chatter. Couch should take this matter up with Baybutt. Couch stated that subline trouble was so bad that it was necessary to shut the machine down last night.

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Sub Conference of February 19, 1937

Nadeau reported that the nitrate cottons received from the Hercules Powder Co. were about like our own F-cottons.

A discussion about the glue on Powers Stripping Film followed, and it was decided to run a Super Speed Stripping Film experiment using gelatin instead of the usual borken down glue, and applying nitrate dope on top of the gelatin. Carber thought that our nitrate was as permeable as Powers nitrate, and that our nitrate skin would strip off of gelatin in a manner similar to wet stripping of emulsion from nitrate support.

T.B. Normal Stripping Film

It was pointed out that although we were 2,000 dozens back ordered on T.B. Normal Stripping Film, the Roll Coating Department had supplied sufficient T.B. Film Base for all the emulsion scheduled in Bldg. #29. Mr. Seel though that more emulsion should be sheduled and a larger stock of this material maintained.

L.S. Cut Sheet

Babcock showed some samples of LS support where F-cotton Uct blends had been tested for haze, and it was noted that when these samples were coated on #55 machine they looked considerably better for haze than when coated on #33 machine. This was considered a good indication when we are on the verge of haze trouble, and new type machines such as 31 to 34 inclusive will be the first to show the haze trouble.

The recent experiment where Methyl cellosolve was used in the Uct ha already been tested for curl, buckle, and South American curl, the results being OK. Incubation tests on the experimental coating were reported as follows:

			0	3 Day	6 Day	9 Day
31-3796	check	5102-403-4	.09	.11	.12	.13
31-4116	expt.	5102-403-1	.10	.11	.12	.13
31-4117	expt.	5102-403-2	.09	.11	.12	.13

Stripping results were OK, and brittleness results were normal.

The above figures should lend further support to the approval sheet, for the use of Me. Cell., which is on the way thru at present.

Mr. Seel inquired as to the recovery of Me. Cell., and Nadeau replied that if we went to the use of methyl cellosolve in sufficient quantity to warrant recovery, we would be able to make special arrangements to recover it in the distillation process.

Mr. Seel stated that he liked the circulating system as it was set up now with the exception of the filter felt, which he stated did not perform the true function of the filter. The amount of circulation in this system is so great that the Uct overflows the filter felt and is not 100% filtered.

Mr. Babcock suggested that the bag filter be used, and Mr. Seel mentioned the bag filter assembly used in building #30 for their filtrations. Mr. Seel also mentioned the use of bolting silk or a metal screen.

In order to improve lines on LS Cut Sheet, 50 ft. experiments were delivered where E, E150, and E200 subs were applied respectively on the emulsion side only since it was felt that the reduction of gel on the Pelloid side would get us into dye retention trouble.

Stripping and brittleness results were as follows: (L-50894)

	Sub	Stripping			Britt.		Dye Retention
33-3778	DE200 - OS	OK	OK	Vsp	50	20	OK
	E200 -SS	OK	OK	OK	0	0	
			OK				
33-3779	DE200 - OS	OK	OK	OK	50	20	OK
	E2 - SS	OK	OK	OK	10	0	
33-3780	DE200 - OS	OK	OK	OK	50	20	OK
	E150 - SS	OK	OK	OK	0	0	
Defender					30	20	
					10	0	

The next move a s a result of the above mentioned experimtnts was not discussed.

Babcock called attention to the fact that brittleness on LS continues to show better on the gel side, results being from 10 to 50 on the gel side, and 0 on the emulsion side. Inasmuch as the emulsion side has not shown stripping in some time, it was suggested that the sub might be weakened on this side only. It was decided that since the material we were making now would appear in the market in the springtime when humidity conditions were higher, it would be well not to change the sub and run the chance of stripping trouble.

XRay

Babcock reported that one roll of XRay had been made where a new batch of NS gel 1870 was being tested. This has been coated to 5120-422-26. Incubation results to date are as follows:

	Original	3 Day
Expt.	.02	.04
Check		

Mr. Babcock stated that an approval sheet had been started for the use of DS gel on Safety XRay as a result of successful testing as reported in last week's sub minutes.

Mr. P. Bahr was present and showed the sample which was coated to XRay emulsion after being contaminated withthe sediment in the brass line, and it was noted that the sample was full of badly desensitized spots wherever the sediment appeared on the base. Mr. Babcock recalled also an experiment in which a piece of brass was compared with a piece of nickel in a sample of C sub for 22 months. The samples were weighed before and after, and it was noted that the brass lost an appreciable amount of weight and showed a surface corrosion, whereas the nickel lost no weight and was not affected on the surface. Mr. Bahr also noted that experiments made with brass wire in air section in order to keep the support from curling showed desensitizing action on XRay but when brass wires were replaced with nickel wires this desensitizing action disappeared. Mr. Wells stated that he was of the opinion that Mr. Beel would let us put in nickel lines and nickel fittings but that the job of lining the pump and filter press at building #45 with nickel would have to be deferred.

Bubbles in the Nitrate Dope

A discussion was started on the bubble trouble in nitrate dope, and it was noted that it was a new thing in the RolliCoating Dept. to have bubbles on so many different systems. It was felt that somethingg had gotten into the #12 solvent and caused this trouble. Mr. Wells thought it was possible that the solvent contained some dissolveed gas, and Nadeau pointed out that the trouble came in where the Power Dept. swithhed from coal to gas heating. Mr. Wells stated that it was planned to run one nitrate system with all new solvents to see if this would correct the trouble.

L.S. Cut Sheet

The experiments using Methyl cellosolve in the Uct were shown, and it was noted that the experiments showed better appearance than the check as far as lines were concerned. It was also noted that haze was better when me. cell. was used. It was reported that incubation results would be finished on Monday, which should be compared with incubation results secured on another series of tests with Me. Cell. Eilers stated that an approval sheet had been started to use Me. Cel. in the nitrate Uct., and it was being held up pending the results of the incubation tests.

Haze

Eilers again mentioned that we were running additional 100 ft. of waste about once a week in testing out F cottons for haze, and suggested that a Lab. method might be developed for checking purpose in order to save waste. Babcock pointed out that the haze condition of a few months ago was so marked on the AP2000, and did not cause any wast on the PSS4. Also one process AP2000 was worse for haze than the three process which indicated that there is something about the air circulation and the drying on the new type machines which contributes to haze trouble.

Safety Cine Positive

Tests were run on Safety Cine Positive using DS gel and coated to emulsion as follows:

52-367 Check 19384
52-368 Expt. 19383

When incubation results have been secured, these will be included on the approval sheet to use DS gel on Safety Cine Pos.

Sub Pump

Mr. Babcock reported that progress had been made on the construction of a safety pump for gelatin sub. The old pump was not OKed by Armstrong because it had a glass cylinder. Mr. H. Crouch has succeeded in substituting a silver cylinder for the glass. This pump is a Hickman type pump in which a coil surrounds the silver cylinder, and by a make and break system of actuating the coils, a plunder inside the silver tube is made to move up and down. Another advantage of the use of silver tubes is that magnetic lines of force penetrate the silver more easily than glass thus reducing the heat generated in the coils. The advantage of this type of pump is that less uncertainty will be felt in maintaining a constant rate of sub input over a 24 hr. period.

Yellow Nitrate Base

Mr. Babcock reported that a glass bottle containing new #12 to which had been added a small amount of chemical #1 had turned yellow after three months time, whereas another bottle containing recovered #12, equivalent amount of chemical #1, which originally showed a slight purplish color, had not changed color at all. Nadeau will report on a sample of chemical #1 to be incubated on a glass plate for yellow color.

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Sub Conference of February 26, 1937

L.S. Cut Sheet

Mr. Babcock reported that #34 machine, which was using circulating system on both OS and SS sides, had begun to show "peels h" on the Pelloid sode or OS side, and after some didcussion it was agreed to put the OS side back on can feed for a time.

Eilers stated that the approval for using the methyl cellosolve for the Uct was still in Mr. Seels office unsigned.

Mr. Babcock reported on results of stripping tests where 2 x, 1-1/2 x, and regular amount of gel - chemical were used in the sub on the OS side of L.S. Cut Sheet. The purpose of this coating was to improve the surface lines on this product. No change was made in the sub on the SS side because of danger to getting into bad dye retention. Stripping was satisfactory, nothing worse than "vsp", and brittleness results were all about the same. Mr. Klem reported that all three subs were OK for surface lines. very small pieces

Dr. Eilers stated that another attempt should be made to use the new type pan for immersion subbing on L.S. Cut Sheet, using a pan somewhat longer than that attempted before.

Kodalith

Eilers stated that in starting up #55 machine to coat Kodalith base, about 59 bubble repeats were found and a little pit discovered under each bubble. The machine will, therefore, be shut down and the coating wheel buffed.

Stripping results have been very good on Kodalith, however, more trouble has been experienced this last week with wrinkles in the dope which caused a mottle to appear in the Kodalith sample after processing. It was stated that the sub was weakened slightly yesterday in hopes that it would have some improvement on mottle. Mr. Babcock suggested trying the shallow pans formerly used in the gel tower to improve mottle.

Dr. Nadeau stated that he was going ahead with the wax experiment to prevent sticking of the dope to the wheel. This will be run on Dr. Carver's machine and is expected to be a help in snapline trouble.

Dr. Nadeau suggested that a mixed gel resin sub might be used for Kodalith coating with a bead hopper, which was pointed out however, that bead hopper showed more stripping and lines when previously attempted on Kodalith coatings with single sub.

It was suggested that the gel-Santolite single sub made up with a smaller amount of #7 might be OK to use on Kodalith, and thereby improve sub wrinkles and sub mottle. It was agreed to wait until the approval sheet came thru for its use on Kodachrome.

Kodascope Duplicating.

A Kodascope Duplicating coating is starting today, and Mr. Babcock wondered that inasmuch as sub on Cine Safety had been cut down from 2 x gel to regular amount, in order to improve comblines, if it would not be advisable to make the same move on Kodascope Duplicating. Mr. Eilers stated that the chief trouble on Kodascope Duplicating was flicker. Mr. VanDerhoef stated that this was probably emulsion trouble, and Eilers said that the trouble was not in the base, because the roughest support gives the best coating.

It was agreed that one roll should be made using regular amount of gel in the sub to be included in the next coating. It was mentioned that diagonal dot trouble should be watched in the coating of this roll.

Kodachrome

In order to dispose of defective Kodachrome, one roll of Kodachrome held for cinch marks is being coated to Recordak emulsion to see if stripping and keeping tests will be OK for this product.

Eilers wondered if we could get to the use of Gel-Santolite sub on Kodachrome production, and Nadeau stated that 5 weeks keeping tests would have to come thru first.

Eastman Color Print.

Eilers stated that our production of Eastman Color Print was increasing and that we could not run over 260 ft. speed because of trouble in color application of single density gray applied to the back, 260 ft. being one half the normal, he wondered whether this product could be produced on a coating machine at 520 ft. speed thereby saving production time on the coating machine. Nadeau stated that an attempt should be made to find out why the color cannot be put on the dryer at the high speed. It was suggested that regular gray for Cine Negative was applied under the wheel, however Cine Safety is not equipped with a hopper place under the wheel.

XRay

In the past week there had been no rolls held for stripping, #47 and #48 machines have gone over on class #25 type, i.e., with NS gel on the SS side only.

Nadeau reported that he had received incubation, fog, and mottle results on a roll of XRay subbed with a new type F-cotton containing higher percent nitrogen.. He stated that these tests were OK; step tablet was OK on 6 day result. Curl, South American Curl, curl, buckle and flatness were all satisfactory.

Polwell was asked to make a batch of approximately 50 lbs. of this type of cotton which will be sufficient to coat three or four rolls of Safety XRay. This type of cotton will be required for the C sub as well, but Dr. Nadeau pointed out there was not enough cotton to run on products other than XRay. It was agreed that inasmuch as this type cotton was expected to be an improvement for haze that steps should be taken to work it out on LS Cut Sheet as soon as possible. Preliminary stripping and brittleness have been worked out on Portrait and Cine and they are satisfactory. Dr. Nadeau pointed out that Chemical Plant would be able to get an increased yield from this type cotton.

In connection with regular F-cottons, Mr. Babcock stated that we have asked Chemical Plant to make 4,000 lbs. of 60% alcohol soluble material, this to be used to blend down a large r stock of 90% material to an average figure of 80%. After the 90% material has been disposed of, it is planned to make up 80% material direct.

T. B. Stripping Film

It was noted that TB base had been coming along pretty good. Mr. Couch stated that they had enough TB Stripping Film on hand for the Emulsion Coating Department who have requested a 15,000 ft. coating.

Couch suggested that he would like to use longer rolls of base if it could be arranged, in order to cut down waste. Mr. Wells suggested that he should have Mr. Paddock look this problem up.

D.S. Gel

Preliminary incubation tests on one roll of Gray Cine Negative using DS Gel in the sub have been secured and are as follows:

			Orig.	3 day	6 day
215-7114	1227-293	Expt.	.05	.08	.17
215-7057	1227-293	Check	.05	.09	.24

Curl during processing results were taken and were OK.

Incubation tests have been started. It wawx suggested that if tye two rolls above noted came out OK on the tests that we could get someone to agree to send them out to the trade after which 5 more could be coated. We have not ed throwout trouble recently in the Cine Negative sub when regular gel was used, which is cleared up by the use of DS type gel.

Safety Cine Positive

Two Cine Positive test pieces have been coated to emulsion, one of which used regular gel in the subs, and the other DS gel, roll numbers being

52-367 check 19384
368 expt. 19383

Safety Portrait coated to Kodalith Base

Mr. Babcock showed some samples of Portrait gel and emulsion coatings on Kodalith base. Stripping was passable, South American curl results were somewhat better, than with the standard thick Portrait base. Some internal buckle was noted in the Kodalith coating, but as a whole, this experiment looked promising.

Yellow Nitrate Base

Mr. Babcock exhibited two samples of #12 methyl alcohol sample, one of which was recovered type, and the other new. In each sample some chemical #1 had been dissolved, and both samples were allowed to stand for three months. After this time it was noted that the sample of new solvent containing #1 chemical had turned a decided yellow color, whereas the other sample had not. It was decided to put away further solvent mixtures in an effort to learn more about this phenomenon.

GSB.S salicylic acid.

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Cine Positive Nitrate using DS Gel

Mr. Babcock showed samples of Cine Positive Nitrate tests representative of 10 rolls of PR116 dope where DS Gel was used in the sub. Tests reported on were original and 5 weeks Eastman tests, and sensitometric tests after 6 weeks. The Eastman tests showed practically no difference from companion series of 10 rolls where regular gel in the sub was used. Likewise, the sensitometric tests were as good as the check rolls. It was, therefore, felt that no difference from an emulsion sensitivity standpoint, could be noted in making the above change on Nitrate Cine Positive. However, as a precaution, it was decided to go ahead with one machine on News where DS Gel was used in the sub subject to acceptance of an approval sheet.

Cine Safety using DS Gel

Mr. Babcock reported that the DS Gel in the Cine Safety did not look quite right on sensitometric results, inasmuch as spped and printer's rating first goes up and then goes down. It was agreed that a 400' roll using DS gel and a 400' roll using regular gel should be supplied to Mr. Klem for more thorough testing.

Desensitized Spots on XRay

A discussion ensued on the desensitized spot situation on Safety XRay, and it was pointed out that these spots do no show on the original test but do show on the 3 and 6 day incubation tests. Mr. Wells stated that the period between February 2 to February 24, was the bad period for desensitized spots. Since February 24, when PS84 system went to all cotton dope, white spot situation is much improved. He stated that we should try to prove whether the subs were causing any of this White spot trouble.

Brass line delivering Uet from building #45 to Building #20 was mentioned, it being a possible source of trouble. It was pointed out that an SER had been sent to building #26 which calls for the replacement of brass with a nickel line.

Mr. Folwell has brought up the point that nitrogens are running 0.16% on XRay now, whereas they used to be around 0.24%, and wondered if the thinner layer might be responsible for the production of white spots. It was pointed out, however, that this reduction in nitrogen came in with the change-over to class 21 product which was made last summer, and spots did not appear to the first of February.

Eilers mentioned that building #29 was applying NS gel to a coating to see if this would improve spots.

DS. Regular gel, and NS gel solutions were coated on glass plates and delivered to Staud who had them coated to 5120 emulsion to be put thru 0, 3, and 6 day incubation tests. The 0 test showed no characteristic white spot.

Mr. Evanoff thought the trouble was due to moisture.

It was pointed out that if copper corrosion was causing the trouble thru the scrap in the dope, that longer tumbling should get us out of trouble.

A new system using all cotton and no pulp is due to be started next week, this system will be known as 5-B.

Mr. Vanderhoef inquired about the test where a piece of XRay was coated to emulsion and precessed and spot trouble showed up, after which the emulsion was to be washed off the support, dried, and recoated to emulsion to see if the spots subsequently appeared again.

Babcock stated that 2 tests with and without blue tint in the base showed OK on incubation.

Eilers stated that a test was sent over of Kodalith base made in the bad area, to be coated to 5120 emulsion and tested for spots.

Wells wondered if we could save money by having dope coatings made on long glass plates, and have Dr. Staud coat 5120 emulsion to each face.

Babcock reported that sample of F cotton stored in the old tank compared with F cotton stored in new showed OK on spot test.

Rolls with and without hardner, age 0, 1, 2, and 3 months, were coated and tested for spots, original test was OK, 3 day test is not yet ready.

A spot test from the various batches of scrap on hand are still in the incubator including an A-17 test.

J.B. Wells stated that Mr. S. Wells had coated 3 pieces of support from a bad area in the coating alley at building #29, one of which was a check dried in the normal way, another was dried very hard, still another dried normally and put thru the alley the second time. All samples showed OK for spots.

In connection with moisture spots, Mr. Ireland stated that the trouble would be worse 150 ft. back in the roll than it would be on the ends. In some cases rolls have been tested at the ends and have been free of spots, and later on when a strip tested, the spots will appear thru the roll.

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Mr. Babcock stated that several blends of cottons were being tested for spots. He also stated that the batches of solvent used in building #45 have been all checked over, and it was noted that no batches showing a trace of iron had been used in making up subs.

pH measurements, conductivity, purity, and residue on evaporation were normal on all batches used during the February period.

Wells and Carver suggested extracuring and waterboxing experiments to see if white spots would be improved.

Folwell spoke about the green contamination noted on the cover of the AP 2000 mixer.

Addendum to Minutes of Sub Conference March 19, 1937

For historical purposes we are listing results of additional testing on the use of DS gel in the sub for Cine Neg. support.

Series #1

R.C.L.#1943 September 21, 1933

A 50 ft. sample of Cine Negative support was coated from PR92 dope, building #53, sub being applied to the SS side in the air section and experiments delivered as follows:

#1. x2333 used 50% Methyl cellosolve in the sub, and 60% Pathe amount of chemical #1.

#2. K115 sp. (check)

A long time keeping test up to 10 months, showed that K115 sp was better than x2333. The multiplex showed more density on experiments in high-lights.

Series #2

R.C.L.#4163 May 25, 1934

Various samples of DS type gel having different pH values were delivered by Mr. Bruce, and were made up in Cine Negative sub, adjusting the pH of the final sub to a constant figure by regulating the amount of chemical #1 used in the sub making as follows:

#1. x3155 - Gel #50677 - pH 4.7 - using chemical #1 - K115 Cine Negative solvents.

#2. x3156 - Gel #50678 - pH 4.2 - using no chemical #1 - K115 Cine Negative solvents.

#3 x3157 - Gel #50679 - pH 5.9 - using 100% chemical #1 - K115 Cine Negative solvents.

#4. x3158 - Gel #50680 - pH 5.2 - using 80% chemical #1 - K115 Cine Negative solvents.

#5. K115sp. (check)

The above 50 ft. pieces were all coated to SS Cine Negative Pan and submitted to incubation tests with the following results.

			Orig.	3 day	6 day
#1.	214-3954	Exp 8268	.11	.43	.45
#2.	214-3955	8269	.12	.43	.45
#3.	214-3956	8270	.12	.43	.45
#4.	214-3957	8271	.12	.39	.49
#5.	214-3953	8267	.12	.34	.45

Series #3

R.C.L.#4596 July 18, 1934

#7. 215-4114 75 ft. Flat type Gray Cine Negative FR92, K115sp. (check)
#8. 215-4115 75 ft. " " " " " x3289 - K115
solvents using DS gel 50-710.

The above two samples were coated to SS, Cine Negative emulsion, and put away for keeping tests, results being as follows:

	Fog - Testing Dept. Results					
	Orig.	2 Mo.	4Mo.	6Mo.	8Mo.	10Mo.
8915 Exp. 215-4115	18	20	23	23	19	16
8916 Chk. 215-4114	18	21	24	20	19	17

According to Mr. Klem's report dated February 20, 1936, the above results indicate that the experiment shows no real difference from the check.

Sensitometric results from the Research.

Emulsion 8915 - 215-4115

Keeping Period	Testing Date	7 minute results Clear	Gamma	Blue	Green	Red	Fog	Gamma - 0.60 Speed	Time	Fog
Orig.	------	--	---	--	---	--	.07	--	--	---
3 Mo.	11-13-34	120	.58	--	---	[illegible]	.07	130	7.3min.	.07
6 Mo.	2-9-35	130	.66	34	18	[illegible]	0.09	120	6.1 "	.07
9 Mo.	5-9-35	160	.81(?)	31	15	[illegible]	.07	150	6.8 "	.07
12 Mo.	8-9-35	95	.57	20	10	[illegible]	.09	110	7.6 "	.09
Emulsion #8916 V-	215-4114									
Orig.	-------	--	--	--	--	--	--	---	---	
3 Mol	11-13-34	120	.63	--	---	--	.09	110	6.5min.	.07
6 Mo.	2-9-35	130	.63	34	18	36	.08	120	6.5 "	.08
9 Mo.	5-9-35	140	.58	30	15	36	.09	140	6.2m "	.09
12 Mo.	8-9-35	100	.57	21	12	21	.08	120	7.5 "	.08

Mr. Mc E. Russell comments in his letter to Mr. Klem of January 10, 1936 that " results tabulated indicate that both coatings have practically the same keeping qualities."

G. S. Babcock

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Sub Conference of March 19, 1937

Safety XRay - DS Gel

DS gel in sub on #47 machine has been running since March 11,. Arrangements have been madd with Mr. Klem to test some of this product for stripping, brittleness, and incubation for white spots to compare with other XRay using regular gel in the sub.

In connection with the 0, 1, 2, and 3 month old rolls, with and without hardner, it was decided to coat a short piece from each of these rolls to XRay emulsion and have Mr. Rupert test for blisters using the exhausted processing solutions.

Safety XRay - White Spots

Dr. Eilers stated that white spots were appearing on the regular coatings whereas the 21 ft. daily tests were not showing spots.

Mr. Babcock showed some plate tests where a blue litmus sheet had been placed on top of a piece of Safety XRay support which in turn lay down on a clean glass plate over moist blotter, and paraffin put around the edges to prevent moisture from leaking around the edges of the support. Two such plates were exhibited, #1 which was known to show white spots on regular incubation tests, and #2 which was free of white spots. It was noted that the blue litmus tests with sample #1 showed several pink spots whereas the #2 sample showed none. Mr. Babcock suggested that this might be a possible test to discover whether the XRay base was satisfactory from a spot standpoint. It was decided to repeat some of these tests during the coming week.

Mr. VanDerhoef spoke about some tests by Mr. Tucker in which the immersed emulsion coated XRay in nitric acid followed by potassium-ferrocyanide, which developed blue spots indicating iron and brown spots indicating copper.

Mr. Babcock showed a set of glass plates which had been subbed with (1) NS Gel, (2) regular gel, (3) DS Gel. These plates were all coated to XRay emulsion at Dr. Staud's and incubated for 6 days, after which time they were flashed and developed. These plates showed no characteristic white spots. This is an indication that various gels as well as chemicals #1 and #2 are free of spot trouble.

It was decided to include a good and bad check for spots in test rolls coated for spot test troubles. It was agreed to use the roll coated last December for a good check, the bad check to be supplied by Mr. S. Wells from current stock.

Safety XRay - Strippi(

Mr. Babcock stated that brittleness results on the XRay tests were running 20 to 40%, whereas regular coating tests in the oven at the same time only show 0 to 10%. This is an indication that wee are getting into wet stripping trouble, although regular GH sub has not been changed for about 2 months. The sub was strengthened to G on March 16 to off-set wet stripping. There has been no change in the NS gel, nor in the batches of gelatin used in making up sub solutions since the first of January. It was felt that some change in the drying at building #29 might be responsible for fluctuation in stripping. This is borne out by the fact that sample from roll 48-1686 was delivered a week or 10 days ago and stripping results were solid OK. However, the sample showed cross line trouble, and the same end of the roll was again coated to emulsion and retested for cross lines. This time cross lines were passable and Testing Department reported "str e lee". This incident occurred at the same time when wet stripping was being noted on some other Roll Coating tests. Mr. Babcock noted that the scrap had been removed from the system on February 24, and that rolls from regula r coating that showed stripping were roll coated February 28, and March 2nd.

Dr. Eilers inquired about the rate of sub flow on XRay. This has been looked up, results being as follows:

February 24 to March 7 105 to 130 lbs. per hopper per day.
March 8 to March 19 125 to 143 " " " " "

Inasmuch as the wet stripping on Safety XRay occurred in the vicinity of March 17, the rate of sub flow is not considered a factor.

Dr. Eilers reported that Dr. Carlton was having trouble with scraping on the edges of the cups due to the NS gel. If the NS gel is applied inside the knurls, static trouble will develop. It, therefore, seems advisable at the present time to increase from 1/4 to 1/2 hardner in the NS gel coatings, inasmuch as blister trouble was about the same for the 2 amounts of hardner. It was decided to coat 20 rolls with 1/2 amount of hardner for Dr. Carlton's observation.

Mr. Babcock reported that NS 1870 has been used in 5 rolls, 3 of which have been coated to emulsion. Tests are on the way thru. This will be a final test for this batch of gel.

L.S. Cut Sheet

Surface lines on the LS Cut Sheet are still causing trouble. It was decided to push along the experiments where 150%, and 100% gel was used in the sub instead of standard 200%. Dr. Eilers stated that the lines on the Pelloid side were the ones necessary to improve, inasmuch as these show in the regular coating. The quality of emulsion is not affected by these lines. Mr. Babcock cautioned to watch for dye retention and stripping, also suggested the use of DS gel or chemical #5 or both.

Mr. Wells suggested using squeegee against the roll similar to a former experiment Dr. Carver had run some time ago.

Stripping Film

Mr. Wells suggested the use of DS gel in the sub for T.B. Stripping Film to improve lines.

Kodachrome

Mr. Babcock reported that reversal tests on Kodachrome were showing stripping on the coatings of March 12 and 13. It was also noted that only 370 lbs. of sub waere used on that day where bad stripping came in, our standard procedure is 700 lbs., and it was decided to watch the sub flow as a possible cause for this stripping trouble.

It was decided to hurry along the new sub pump, with the idea of putting it on the Kodachrome machine.

Eilers stated that rolls of Kodachrome whowing stripping could probably be used for Recordak coatings, and that approval sheet was now on the way thru for permission to do this.

Kodalith

On March 4th, sub was weakened slightly on SS side and sub mottle has improved, 95% of the rolls coming OK for sub mottle. Yesterday the sub was again weakened slightly.

DS Gel in Sub for Nitrate Cine Negative.

Babcock reported that an approval sheet has been started to use DS gel in the sub on one News machine to run indefinitely to see if any trouble is picked up on this product. If results are OK we will extend the use of DS gel over to regular Cine Positive machines.

DS GEL in Sub for Nitrate Cine Negative

Babcock reported sensitometric results obtained on the testing of Cine Negative support where DS Gel was used in the sub, results being reported by Russell of the Research Lab. as follows:

Subject: Incubation keeping on the following Super X Cine Negative emulsions:

1227-293-13, coated 2-6-37
1227-295-53, coated 2-12-37

These coa tings represent special rolls which feature the use of a new type of gel in the sub.

1227-293-18
1227-295-50

These are checks for the above coatings.

Test: Exposures were made to high intensity daylight illumination and developments were made for a series of times in D-76 and 65F. Results were evaluated for a fixed development time of 9 minutes and for gamma = 0.70. Samples were incubated at 120F.

Results: See accompanying table.

Comments: This test shows no significant differences between the special rolls and their respective checks.

K884 Incubation Keeping ST 1663

Emulsion 1227-293-13

Keeping Period	Testing Date	Clear Speed	Gamma	Fog	Blue	Green	Red	For .70 50/E Speed	Time	Fog
Orig.	2-24-37Exp.	970	.72	.02	218	120	180	910	8.7'	.02
3 day inc.	3-4-37	720	.63	.07	180	99	160	820	10.3	.07
6 day inc.	3-4-37	600	.63	.10	150	77	130	710	10.5	.12

Emulsion 1227-293-18

Orig.	2-24-37Chk.	870	.68	.02	220	120	200	930	9.4	.02
3 day inc.	3-4-37	720	.64	.07	180	99	170	810	10.1	.08
6 day inc.	3-4-37	630	.64	.10	150	91	140	750	10.6	.10

Emulsion 1227-295-50

Orig.	3-24-37Chk.	870	.70	.06	210	120	180	870	9.0	.06
3 day inc.	3-4-37	790	.60	.08	180	95	170	930	10.5	.09
6 day inc.	3-4-37	550	.63	.09	140	87	130	690	10.4	.10

Emulsion 1227-295-53

Orig.	3-24-37Exp.	900	.70	.04	200	110	185	900	9.0'	.04
3 day inc.	3-4-37	770	.62	.06	190	100	170	970	10.8	.07
6 day inc.	3-4-37	520	.60	.09	93	93	150	740	11.3	.10

Inasmuch as the above results look encouraging, it was decided to coat 3 more rolls of Cine Negative, each roll using a different batch of DS gel in the sub, these rolls also to be put thru sensitometric and keeping tests. It was also decided to look up results on a previous long time test that had been started, (215-4115 made 7-27-34).

Kodacolor

Eilers stated that in coating Kodacolor base for Micro-file, it was necessary to reduce to a speed of 266 ft. when backing was applied on the SS side. It was felt that if the color could be applied on the OS side (like Cine Safety) that this would make a satisfactory product for Micro-file work providing the curl is OK. An experiment is to be run trying out the above idea with the speed of the coating noted.

GSB:S

Sub Conference - Friday, April 2, and Tuesday, April 6, 1937

Safety XRay - White Spots

Mr. Babcock showed some plate tests in which a moist blotter had been laid down on a glass plate and crystals of various inorganic salts; viz, bichloride of mercury, ferrous sulphate, ferric chloride, nickel sulphate, and copper chloride, were placed in the center of the blotter. A piece of completely subbed base was then placed over the blotter and the edges sealed to the glass/paraffin . This plate was then taken in the dark room and a piece of sensitized XRay film placed thereon, and the whole covered with a glass plate and the edges taped. Samples were then placed in light-tight boxes and incubated over night at 120F and the following day the XRay film was given a light flash and put thru processing solutions. It was discovered that none of the salts above mentioned show any appreciable amount of effect on the film with the exception of mercury which shows bad desensitization on both sides of the XRay film. Subsequent testing carried out in the same manner, except that multiple layers of sensitized XRay film were used, shows that the bichloride desensitization could be noted thru three thicknesses of XRay film, the fourth, fifth, and sixth being unaffected. Messrs. Vanderhoef and Babcock are planning further tests in which the influence of the mercury salts, as well as rubber and sulphur in the dope may be noted.

It was decided to put away 200 ft. lengths of carious types of film base in storage so that they would be available at some future time for checking purposes when emulsion keeping troubles are encountered. Mr. Babcock to see that these rolls are collected. (Ref. L-52242)

It was noted that one sample of AAA acetate showed 25,000 white spots for standard area, whereas regular coatings were showing 0 to 7 spots.

Mr. Wells suggested that Safety XRay now on hand being held for white spots might be resubbed with a vinylite resin to prevent white spots due to mercury or other sources from coming thru the film. He also suggested that some such procedure on current product might be adapted on the theory that resin would be less permeable than nitrocellulose to the spot trouble. Mr. Babcock suggested that some plate tests could be run where mercury salt was deliberately used to see whether it would penetrate a vinylite coating, and it was agreed this should be done. It was also agreed that Dr. Nadeau should proceed with some experimental coatings, waterboxing if necessary, which involves the use of a resin to prevent white spots from showing in the e mulsion.

Mr. Babcock pointed out that 50 machine was still being run with Uct made at building #45 in cans, and trucked across the road to Building #20 to avoid running thru the brass line. The purpose of this was to see if the white spots could be eliminated. Results showed that on March 28, when the spots were particularly bad, 50 machine was about average for spot trouble, samples showing 5 spots as against 2 for 56 and 7 for 47. It was agreed that these experiments were not showing any promise and that the regular Uct from the line should be put back on this machine.

Safety XRay

In connection with the production of London Blue XRay, it was pointed out that a new type machine such as #33 be used for this product, and it was agreed to make one roll on #33 machine and obtain shrinkage, S.A.curl, flatness, and incubation tests. Special attention should be paid to the special width necessary for this product, and Dr. Eilers is to do this. The blue tint is to be mixed with the gel sub, and DS gel used to prevent throwout troubles. After the tests have been heard from on the above roll, and provided they are satisfactory, it was agreed to make an experimental run of 10 rolls to see if the waste exceeded 7-1/2 to 10% which is the present figure on a drum machine.

Mr. Babcock reported that P884 Domestic XRay experiment coated on #32 machine showed solid OK for stripping and normal for brittleness. Dr. Nadeau stated that the flatness tests would be thru shortly.

Mr. Babcock stated that 35 to 40 rolls, P884 XRay have been produced to date from #47 machine where DS gel was used in the regular sub. The emulsion tests on these rolls have been heard from, and the results are OK. It was, therefore, decided that an approval sheet should be started to change over the rest of the XRay machines to DS gel types, preferably changing over one machine every two weeks.

Mr. Rupert has reported on blister tests using exhausted fixing bath for the 0, 1, 2, and 3 month old rolls of XRay base with and without hardener. He reports that the rolls using hardner show up better for blisters than rolls where no hardner is used. It was also noted by Dr. Eilers that Dr. Carlton has again complained about particles of NS gel collected on the emulsion dups during coatings at building #29. In order to help Dr. Carlton with this problem, 20 rolls of Safety XRay have been delivered to building #29 where 1/2 the regular amount of hardner was used in the NS gel in place of 1/4 the amount regularly used.

Experimental F Cottons.

Dr. Nadeau reported that 50 lbs. of special F cotton made by Mr. J. Folwell involving a larger percentage of nitrogen and lower alcohol solubility had been coated in a small way and that tests would shortly come thru. If these tests are satisfactory, the remainder of the 50 lb. batch may be used to coat 4 rolls of Safety XRay for further testing.

Cine Negative - DS Gel

Attention was called to additional data on keeping tests up to 10 months on Cine Negative where DS gel was used in an experiment. This data is attached to minutes of March 19, meeting and fog results are the same for experiment as check. It was decided to arrange to get the 2 rolls of Cine Negative recently coated shipped to the trade as a further step in proving out DS gel on this product. Dr. Carver suggested if necessary the incubation tests on these 2 rolls could be repeated.

Portrait Tech - DS Gel

Mr. Babcock showed a sample of Portrait Tech which contained regular gel in the sub and which showed more haze and rough appearance than another sample of regular Portrait subbed with DS gel in the sub. It was agreed to start testing on Portrait Tech. for the use of DS Gel.

Safety Portrait - DS Gel

Mr. Babcock showed the results of 14 months keeping tests on the use of DS gel in Safety Portrait which were as follows:

	Orig.	2 Mo.	4 Mo.	6 Mo.	8 Mo.	10 Mo.	12 Mo.	14 Mo.
8933 Exp. (DS Gel)	6	7	10	10	7	9	15	13
8934 Chk. (Reg.Gel)	7	7	8	9	7	9	11	10

Mr. Klem concludes that there are no real differences shown between the experiment and the check

It was decided to start an approval sheet for the use of DS gel in the sub on Safety Portrait, also incorporating the idea of reducing gel in the sub for improved appearance, inasmuch as stripping, brittleness, and dye retention have already tested out OK in previous tests.

Kodachrome

It was pointed out that Kodachrome rolls subbed with x1000-A gel-acetate sub occasionally show OK stripping results with regular processing but N.G. on reversal processing. Since Recordak does not use reversal processing, rolls of this type may be transferred to Recordak stock for disposal. Necessary incubation tests on the above change have already been run and have shown to be OK as per approval #2358

Dr. Nadeau stated that in a recent experiment where a vinylite resin was substituted for cellulose acetate solution on the back of Kodachrome, base, this fillowed by the use of Jet lubricant solution, shows promising from the standpoint of the elimination of pink stain which has been found to be confined to the back of the film, and which appears after processing. This stain trouble is particularly improved when the new glycol developer is used. Such tests have been OK for usual transference and bleach tests as well.

Kodalith

Dr. Eilers explained that Mr. Beach had run some experiments using 1/2 tone dye in Ortho Kodalith emulsion, however, sub streaks have not been improved as a result. He stated that Mr. Beach would run further tests on the emulsion to improve this condition.

It was pointed out that Kodalith tests were showing better than the regular coatings for sub streaks even though the same Kodalith gel and emulsion were applied to the t ests as to the regular rolls. Dr. Carver suggested buffered gel to help sub streaks, but Dr. Eilers explained that this had been tried and that the speed of the emulsion was changed, and Mr. Arnold would not agree to this move. Mr. Wells suggested waterboxing, Dr. Nadeau stated that this would dissolve the gel of the sub, and Dr. Carver suggested waterboxing with cold water to remove sub ingredients that might cause desensitization.

Mr. Babcock not ed that the stripping on the first series of wide Kodalith delivered from #221 machine was coming Vsp to OK. The product is showing scattered sub streaks. Above as per report on roll 221-6234 and 6243, test numbers 62017 and 62020.

Gum Kodapak

Mr. Babcock called attention to his experiment which involves the use of chemical #5 in Kodapak sub in place of chemical #1, stating that this produced a more stable sub for handling on this Operation, also that the appearance of the final product was very slightly improved from the bloom standpoint. It was pointed out that comparative cost of the various chemicals for 100 lgs. Kodapak would be as follows:

Chemical #1	(salicylic acid)	$0.10 per 100lbs Kodapak
Chemical #2	(lactic acid)	$0.90 " " "
Chemical #5	(malonic acid)	$1.50 " " "

After some discussion it was agreed that the use of increased amounts of chemical #2 would not improve the appearance of the sub sufficiently to warrant its use. Dr. Nadeau suggested that chemical #1 might be increased in half steps to effect sufficient improvement in the appearance of the sub to be usable.

USE of Regular Amount of Gel in Kodascope Duplicating instead of 2xAmt.

Mr. Babcock showed results on keeping test of Kodascope Duplicating as follows:

5504-154-12 2 x gel (check)
5504-154-14 1 x gel (Expt.)

These tests indicated that there was no difference in sensitometric in speed, gamma, a nd fog, when regula r amount of gel was used as compared with 2 x gel. Stripping results were solid OK, and brittleness was normal for this product. Dr. Carlton has examined this coating and finds that one roll shows nor more appreciable flicker than did the other. It was, therefore, decidedc to start an approval sheet to go to the use of 1x gel in order to improve the appearance of this product.

F510 Cine -DS Gel C O

Roll 222-6069, 1200 ft., has been delivered using DS gel in the sub x1260. 222-6070 has been delivered for check using K117 sp, and Mr. Klem has been notified to have these coated together in the same emulsion for testing.

Yellow Color of Nitrate Dope

About two months or so ago when nitrate dope was delivering rolls with more than the usual amount of yellow color, some experiments were started to see if this color could be developed on a laboratory scale. Accordingly a sample of nitrate dope, which was known to give yellow color in the regular coating at that time, was coated on glass plates. Samples of the skin were then subbed with subs of various make-up, samples incubated in an oven at 240F for two hours, and subsequently mounted on white paper in 6 thicknesses each for color comparison. Results of the first set of tests were as follows:

Series #1

No.	Sub	Make-up	Gel	Yellow
1.	x1069	Chem. #5, regular amt. of stock	DS	OK
2.	x1068	" #2 Lactic acid " " "	"	Vslight
3.	x1065	" #1 Salicylic acid Half reg. amt. of	"	Slight
4.	x1066	" #1 regular " " "	"	Slight+
5.	x1070	" #1 " " "	Reg.	Slight+
6.	x1067	" #1 2 x reg. amt. of stock	DS	Yellow

It, therefore, appears that chemical #1 was causing the color to develop, the color being more intense as the concentration of color was increased.

Series #2

Following the above information, a series of subs using various combinations were coated on glass plates, the sub layer being built up by successive applications in each case. Various combinations of chemicals with gels were made, but after incubation no yellow color developed. A sample of subbing gel was made up with distilled water and methyl alcohol without using any chemical, and used on a nitrate skin as in series #1. No yellow color was developed on incubation.

Subbed samples were made up where the gel was omitted in each case as follows:

No.	Sub.	Make-up				Yellow
1.	x1145	K115 - no gel -	1/2 x	Chem.	#2 lactic acid	OK
2.	x1146	" " "	1 x	"	#2	OK
3.	x1147	" " "	2 x	"	#2	OK
4.	x1148	" " "	1/2 x	"	#5	OK
5.	x1149	" " "	1 x	"	#5 malonic acid	OK
6.	x1150	" " "	2 x	"	#5	OK
7.	x1142	" " "	1/2 x	"	#1 Salicylic acid	Sl
8.	x1143	" " "	1 x	"	#1	Sl
9.	x1144	" " "	2 x	"	#1	Yellow

It, therefore, appears that chemical [redacted] and gel mixture on glass does not develop color. It also appears that a gel solution on nitrate base without chemical does not develop color, and when chemicals #1, 2, and 5 are dissolved in the sub formula without the addition of gel that the color is still developed in the case of chem. #1, whereas no color is observed in the case of chemicals #2 and 5.

Series #3

Inasmuch as the trouble due to yellow color in the dope is not being noted at the present time, at the suggestion of Mr. Folwell some of the sub tests were repeated to see whether the yellow color would still develop. The following set was run.

No.	Sub	Make-up					Yellow
1.	X1145	K115 -	1/2 x	Chem.	#2 lactic acid	- no gel	OK
2.	X1146	"	1 x	"	"	"	OK
3.	X1147	"	2 x	"	"	"	OK
4.	X1142	"	1/2 x	"	#1 salicylic acid	"	Sl.
5.	X1143	"	1 x	"	"	"	Sl.
6.	X1144	"	2 x	"	"	"	Yellow

The above indicates that the yellow color will still be developed in the case of chemical #1 without gel applied to nitrate base, whether the yellow color does or does not show in the regular coatings.

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Series #4

In connection with the above subbing tests, various samples of solvent with 1% of our different chemicals were put aside in glass stoppered bottles to see if any color would develop. After a period of 3 weeks, it was noted that no color developed with the following combinations:

New	#12	and	chemical	#1 salicylic acid
Recovered	#12	"	"	1
New	7	"	"	1
New	12	"	"	2 Ladic acid
Recovered	12	"	"	2
New	7	"	"	2
Recovered	7	"	"	2
New	12	"	"	5 malonic acid
Recovered	12	"	"	5
New	7	"	"	5
Recovered	7	"	"	5

In the case of recovered #7 and chemical #1 a decided yellow color developed within a few days. In order to check the above, two other samples of recovered #7 were obtained and allowed to stand with 1% chemical #1, and it was found in each case that a yellow color developed. In another wet a sample of recovered #7 was divided into two parts, one percent of chemical #1 being added to each part, and one sample allowed to age in a light-tight box and the other aged in daylight. It was found in 3 days a yellow color developed in the daylight sample, whereas the other sample appeared water white. After 3 weeks, however, the sample enclosed in the box had developed a slight yellow color. This indicates that a reaction will proceed without the presence of light but that the presence of light accelerates the speed of reaction.

After a discussion of the above data, Dr. Nadeau felt that the color was due to the formation of a metallic salt (probably iron) with the chemical #1, although the usual color reaction with iron is a purple or blue color salt. The matter is still left open for discussion.

GSB:S

C O

Sub Conference of April 9, 1937

Percent Solids in Uct in Circulating Systems

The following data secured over the last two months is reported to show the ratio of percent nitrate, and percent #47 in the circulating systems used on our Safety Cut Sheet. It should be noted that the percent nitrate in the Uct as delivered to the systems runs in the neighborhood of 3.5%. This is also a percent solid figure, inasmuch as no #47 is contained in the Uct as delivered.

tri-phenyl phosphate

Circulation System for Uct.

#33 Machine - AP2000 Dope - Daily Tests

Date	% Nitrate	% #47	Total
2-26	3.09	1.13	4.22
2-27	3.26	1.06	4.32
2-28	3.31	1.23	4.54
3-1	3.37	1.26	4.63
3-2	3.21	1.12	4.33
3-3	3.15	1.07	4.22
3-4	3.39	1.10	4.49
3-5	3.15	1.07	4.22

		--- Mar. 26---			--- April 2---			---April 10---		
Mach.	Dope	% Nit.	% #47	% Total	%Nit.	% #47	% Total	%Nit.	%#47	%Tot.
33	AP2000	3.48	1.25	4.73						
34	"		1.05							
47	PS#4	3.70	1.16	4.86	3.66	.96	4.62	3.86	0.89	4.78
48	"	3.42	1.63	5.05	3.49	1.42	4.91	3.97	0.92	4.89
49	"	3.54	0.94	4.48	4.76	0.87	5.63	3.63	1.15	4.78
50	"	3.42	1.06	4.48	3.62	0.97	4.59	3.92	0.68	4.60

It is noted in the daily test readings, the percent solid is fairly consistent over a period of several days. It is interesting to note that as the drawoff from the systems is increased, percent #47 has a tendency to be lowered.

The current nitrogen results secured on Cut Sheet products under the above operation are 0.18 in the case of XRay where no C sub is used, and 0.24 in the case of Portrait using a C sub.

Safety XRay Stripping

It was noted that the subs were all strengthened one half point during the last week because of wet stripping troubles. Dr. Eilers has also reported that 30 odd rolls of regular coatings had been discarded because of wet stripping, although the daily tests showed no trouble in the zone where the above rolls were coated. It appears, therefore, that the tests are not perfect indication of the stripping to be expected on the final coating. Mr. Babcock noted that in the past the presence of triphenyl phosphate in the subbing solutions had an adverse effect on stripping. Dr. Eilers noted that if methyl cellosolve was a poorer solvent for #47 that it would not extract quite as much, and would therefore, result in a lower #47 content in the circulating Uct which should be an improvement in the case of AP2000 Portrait.

Mr. Wells inquired what the percent #47 amounted to when the normal drawoff was taken with the regular pan feed. This has been looked up and found to be as follows:

51 pan feed	0.19%
52 pan feed	0.61%

In connection with the general stripping troubles, it was noted that building #29 was experiencing stripping trouble off the Uct on Nitrate Cut Sheet. Mr. Seel stated that it was nothing new that building #29 had stripping trouble on certain days.

In connection with stripping and brittleness problem on Safety XRay, Mr. Seel stated that it had been proposed to perforate small holes in the corners of XRay film so they could be buttoned on the corners of the support. Obviously any film showing bad brittleness would be the subject for a complaint. Mr. Babcock suggested that Blue AA had given us best over-all brittleness, but had some drawbacks from the standpoint of stripping. Dr. Nadeau suggested that the gel Uct method might work out well in this case.

An approval sheet has been started to go to the use of DS gel on all Safety XRay machines at two weeks intervals.

Gray Kodacolor

Mr. Seel mentioned that there was a call for a Gray Kodacolor base which should be used for large size enlarger. Three or four 1000ft. rolls were required, and it was desirable to obtain material with more even coloring than was secured in the past. It was decided to try producing this support by applying the gray to the OS side at #3 place instead of on the SS side as has been past practice. (Refer to Roll No. 52-688, R.C.Letter #52302)

Dr. Eilers stated that it would be useful to have a hopper installed under the wheel on #51 machine, inasmuch as 51 machine was not of much good for applying color at the present time for Kodachrome coatings which requires the use of 52 machine.

News - DS Gel

Mr. Babcock stated that about 100 rolls of News have been coated on 218 machine using DS gel, and noted that #35 machine was about to be started up in Building #20 on this same product. It was decided to use DS gel on this machine.

N510 Cine Positive - DS Gel

One roll of N510 Cine has been coated using DS Gel on #222 machine and this roll has been coated to emulsion for testing. This prodedure will help comblines on N510. Mr. Wells stated that this testing should be pushed along.

Nitrate Cut Sheet.

An approval sheet has been received to use a common sub on Low Dye Retention Portrait and regular Portrait base. All machines on Nitrate Cut Sheet have been changed over this week to the common type sub.

Portrait Technicolor - DS Gel

A 50 Ft. piece of Portrait using DS gel has been delivered to be coated to Robo emulsion for testing purposes. (Ref. R.C.Letter-52274) Roll. No. 29-6831 .

N.S.Gel

Batch 1889 of NS gel is being tested, one full roll of Safety XRay has been coated.

Kodalith, Dental XRay, Wire Photo

Mr. Babcock stated that Kodalith produced in the last week was better for sub streaks than the week before. Mr. Wells stated that the production from building #53 was all OK.

Mr. Babcock noted that 4 rolls of Kodalith in a good area for stripping were selected for Wire Photo coatings, and 3 came bad for wet stripping. This is the first indication that Wire Photo is worse for stripping than Kodalith. We have had experience on Dental XRay with wet stripping, and this has overcome by the use of C sub with regular sub.

Dr. Eilers stated that an approval sheet was on the way thru to put blue tint on Kodalith base for Dental XRay purpose. Class #25 XRay base will be used for heavy type Dental XRay.

Dr. Eilers reported that he had compared Kodalith film made by Hammer with the E.K. type Kodalith product, and stated there was very little difference in physical properties. However plasticizer was 16% #47 for Hammer and 19% for E.K. He stated that nitrogen content for Hammer showed 0.3 and 0.11% on two

samples tested, whereas E.K. was 0.01, and it seemed probable that C-sub and gel sub were used on the Hammer base. The Hammer base is not a good looking support, and does not have as low shrinkage as E.K. product, but surpasses in emulsion quality, in better reproduction, and shades of color rendered. Mr. Beach is working on a half-tone emulsion to improve this condition.

Uct made in Cans

Mr. Babcock reported that #50 machine using Uct made in cans had been discontinued this week, and was being supplied from the main line, inasmuch as no improvement in white spot trouble was noted on this machine.

200 ft. Lenghts of Various Bases for Testing Purposes

Mr. Babcock stated that 200 ft. rolls of various types of product had been collected during the past week and put in storage in Bldg. #7 and held till some future time for comparison in connection with emulsion troubles. Mr. Couch suggested that some Eastman Direct Positive, T.B. Stripping Film, Super Speed Stripping Film, Tracing Cloth, and Aero Mapping Paper should be included with the above list and it was agreed that this should be done.

GSB:S

Sub Conference of April 16, 1937

T.B. Normal Stripping Film

Mr. Couch showed a sample of T.B.Normal Stripping Film which had quite a number of lines running with the support. These lines are not heavy enough however to cause trouble, and it was felt that they originate in the dope application in #25 machine. The sample also showed a crazed effect on the surface. Mr. Couch though that this trouble originated from the glue coated in building #29, which is very brittle. If this glue were put on in building #21, the coating would be more flexible, but skidding would have to be overcome. A larger threadup would also be required, which is a disadvantage because of curl in the coating of the dope. This would also involve taking the wheel out of #25 machine and building an air section so that two machines would be available for coating.

Dr. Nadeau mentioned, in connection with the Finished Film Department, where T.B.Stripping Film is cut up and automatically marked "Safety Film", when actually the picture stripped from the base is coated on nitrate, that AP2000 was giving about the same stripping time as nitrate and was not showing too much swell. The only trouble was that a lot of little star-like defects over the support were noted, and it was felt that this could be avoided by choosing solvents that do not attack the glue, or by changing the type of glue. Mr. Couch stated that #25 and #26 machines would be available all week to run experiments.

Eastman Direct Positive

Mr. Couch stated that he had a stock of over 100,000 ft. of Eastman Direct Positive, and that durrent production was 25,000 ft. per week. He said that very little trouble was being experienced from waterproofing. Dr. Nadeau inquired if there was any intention to go to the use of AP2000 dope for waterproofing, and Messers. Couch and Wells stated that the waterproofing of AP cotton would not be as satisfactory as with nitrate. The concept of water penetration and amplitude is that nitrate is the best, AP2000 next, and followed by CSA.

Kodachrome Film of TB Base

Mr. Couch spoke about a sample order of TB Normal Stripping Film which was subbed with Gelma resin, C sub and gel sub, and has been delivered to Dr. Carlton to coat to Kodachrome emulsion, inasmuch as this process is considered good for dye retention. The thought in back of this coating is that the print could be stripped off and mounted on white paper. Dr. Nadeau stated that at present Kotava base was being considered for this process.

Kotava Base

Dr. Eilers noted that we had only about 1000 ft. of Kotava base on hand, and suggested that the next time this material was required, it be made on #32 machine using the resin threadup by which process the Kotava pigment could be covered with C sub before coming in contact with rolls on the machine, and therefore avoid cinches. It was decided to run an experiment along these lines.

Safety XRay

Mr. Babcock reported there had been some wet stripping during the last week on #46 and 83 machines, using FG and F subs. He also noted that since the first of March, it had been necessary to progressively increase the strength of the regular sub from GH to FG and F in order to keep away from wet stripping. In order to find out where we stand on sub strength, a series of subbing tests were run, results of which are as follows:

No.	Test No.	Sub	Stripping	Brittleness			
1.	63081	E	OK	30	15	20	10
		E	OK				
2.	63082	EF	"	30	10	20	10
		EF	-				
3.	63083	F	"	30	10	30	10
		F	-				
4.	63084	FG	"	20	10	20	10
		FG	-				
5.	63085	G	Vsp	20	30	35	20
		G	OK				
6.	63086	GH	Vsp	30	10	10	0
		GH	OK				
7.	63087	H	Sp	40	10	20	10
		H	Peels H				
8.	63088	HI	Sp	40	20	40	10
		HI	PeelsH Le				
	DuPont			0	0	0	0
	Agfa			0	0	0	0
	Gevaert			90	90	70	90

It was interesting to note that the material is passable down to and including H sub in strength, whereas in regular running it is necessary to use FG or G. This would indicate that the fresh sub, a short test piece, will stick emulsion more readily than after the sub had been running for some time, and Mr. Babcock suggested the Spicer Dufay method of sub application should offer some advantages

from a subbing standpoint here. Dr. Nadeau stated that some experiments with Spicer Duf[illegible] method would be run as s[illegible] as the experimental drum had been erected in building #19.

Mr. Babcock stated that the drawoff on the regular sub hopper for the XRay machines had been measured, and that of the 12 hoppers involved only 3 were being operated with a high enough rate of drawoff, the remaining varying anywhere from 1/2 to 4/5 gallon per hopper per hour whereas 2 gallons per hopper per hour is standard.

NS Gel

The following conductivity measurements have been determined on NS gel solutions with and without salt ~~xxx~~ addition.

A - Without salt
1. 5.9×10^{-4}

2. 6.4×10^{-4}

B - With salt
1. 2.2×10^{-3}

2. 2.2×10^{-3}

It was the feeling of those present that the conductivity of these solutions should be periodically checked to assure that the salt is being added, inasmuch as this is considered of advantage in prevention of static troubles.

New NS gel batch #1889 had been applied to one roll and coatings have been made as follows:

46-6793 Exp. 5120-562-3

46-6791 Chk. 5120-562-4

To date stripping results only have been heard from and they are OK.

Safety XRay - DS Gel

An approval sheet is on the way thru to use DS gel on Safety XRay machines at two week intervals. Additional fog results on two weeks tropical incubation tests are as follows:

5120-194-12	DS Gel	.10	.11
5120-194-16	Reg.Gel(ck)	.13	.11

Nitrate Cine - Tacky Rolls

Mr. Babcock noted that 222 and 223 machines coating N510 dope had improved somewhat in tacky condition since changing from K117sp. to K99sp. which involves the use of smaller percentage of #7. It is also planned to run a roll with reduced amount of gel in the sub to see if this will help the tacky condition, acetate

N510 Cine Positive

One roll has been coated to emulsion as follows:

222-6069 1301-289-8 DS Gel

222-6070 1301-289-9 Regular Gel (R.C.Letter-52198)

Results will be reported later.

NC and Film Pack - Common sub

An approval sheet is on the way thru to use a common sub on NC and Film Pack for convenience in manufacturing. This approval asks for the use of 80% of regular amount of stock solution to be use in gel sub with chemical #5 (malonic acid). In order to assure ourselves that we will be free of blister trouble, one roll each of NC and Film Pack have been delivered using 60% stock in the sub.

27-5740 NC
27-5741 Film Pack

These rolls are to be coated to emulsion and tested for emulsion quality, stripping, and brittleness. Mr. McCrossen reported that no blisters were noted in the coating of both of the above rolls, spedial attention having been paid to this point.

Kodalith for Dental XRay

Contrary to previous reports, it has been decided to deliver tinted base for Dental XRay, .005-1/2 thick, using nitrate Uct with tint plus regular sub, subs being applied in the same fashion as class #25 product.

Kodascope Duplicating

An approval has been received this week to use 1 x amount of gel in place of 2 x for the regular sub application. This is expected to improve the appearance of the surface of the support.

Cine Negative - DS Gel

Mr. Seel has approved the coating of 10 additional rolls of Cine Negative using DS gel in the sub.

Static on Eastman Kodak vs. DuPont Nitrate Cine

In a recent Research Laboratory report by L.Al Jones, he noted the difference bn static charges on the back of Cine film as compared with the emulsion side as follows:

Roll No.	Emul. No.	Kind	Total	Base	Emul.
39-1385	1301-134-25	Cine Pos. B&W	-2.3	-2.7	0.3
219-8099	1359-283-13	Sound Record.A	-1.0	-1.5	0.5
214-7027	1227-265-21	SS Cine Neg. Pan	1.0	0.6	0.6

Corresponding static on DuPont products were as follows:

	Total	Base	Emulsion
Cine Positive	2.3	1.8	0.5
Sound Recording	1.7	2.0	0.3
Cine Negative	1.5	1.3	0.4

It is observed that the E.K. products show more negative charges than DuPont. This is considered a disadvantage, in that since the emulsion has a positive charge, therefore a film which shows a negative charge on the reverse side would behave like a condenser, and store up greater charges of static, which might have an adverse effect if discharged.

Subs applied to the E.K. products above listed are as follows:

Roll No.	Dope	Sub	Backing	Composition of Backing
89-1385	XP500	K102Asp	---	---
219-8099	PR116	K94sp	x-5050	Imbibition solvent
214-7027	PR115	K115sp	x-5507&CB	Grey backing followed by cellulose acetate backing

It therefore appears that the cellulose acetate exerts a favorable static balance, in the case of the E.K.Cine Negative. On the Cine Positive, and the Sound Recording of E.K.Co., where not any acetate is applied, the static charge is negative.

It is interesting to note that the outside scrapings of the back of DuPont Cine Positive analysed 10.44% nitrogen, whereas in the middle of the base, the result was 11.64%. The percent nitrogen in E.K. dopes runs 11.85% to 12.15%. It therefore would appear that the back of the DuPont film has been treated in some way. This might be a slight hydrolysis, or an actual backing application, although to date, Mr. Robert Titus has been unable to identify a backing layer on this product.

GSB:S

G.S.Babcock

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SUB CONFERENCE OF April 23, 1937

Percent Solids in Uct in Circulating System

Supplementing data on page #1 of April 9th's minutes, please note additional figures secured on percent solids in circulating systems on Safety XRay and Safety Portrait machines.

		April 19			April 23		
Mach.	Dope	%Nit.	% #47 (Triphenyl phosphate)	%Total	%Nit.	% #47 (Triphenyl phosphate)	% Total
33	AP2000	-	-	-	3.57	0.84	4.41
34	AP2000	-	-	-	3.48	1.05	4.53
47	PSS4	3.20	0.37	3.57	- --	----	--
48	"	3.38	1.64	5.02	3.28	1.25	4.53
49	"	3.48	1.79	5.27	3.31	1.05	4.36
50	"	3.37	1.07	4.44	2.93	1.02	3.95

Technicolor Portrait

200'ft experiments have been delivered on Tech. Port. product using N510 dope with and without gel as per R.C.Letter#2401 as follows:

45-2802 200 ft. DS gel in sub N510 dope.
45-2803 200 ft. K46sp. " " " "

A sample of regular Portrait using N510 dope has also been delivered and subbed with standard DS gel sub as follows:

45-2801 200 ft. DS gel in sub N510 dope.

It was noted that this was part of the general (acetone) program to get off of PR and RP type dopes and go to N510 type which latter has better wearing quality, and does not use as much #7 solvent in the dope and will doubtless result in a higher speed product.

NC and Film Pack

An approval sheet has been received to use a common (malonic acid) sub on NC and Film Pack products, this sub uses chemical No. 5 and 80% of standard amount of gel stock solution.

Mr. Babcock noted in connection with the above that another roll was being tested where 60% gel stock solution only was used so that this procedure, if successful, could be resorted to if any

blisters at all were noted on the machine during the use of the sub with 80% stock, pending approval of same. Mr. Babcock noted that we have had very few complaints from sub comblines and throwout on NC and Film Pack products since going to DS gel. Mr. Wells suggested that this new product should be dalled Film Pack until the NC base is used up. After this the entire production from these machines might be called NC.

News

Mr. Babcock reported that some more rolls using DS gel in the sub on News support were being tested to be sure that the change to DS type gel is OK.

Safety Portrait - DS Gel

An approval has been received to use DS gel in regular sub on Safety Portrait.

Kodachrome

It was noted that recent production of Kodachrome was showing some stripping on reversal testing. Four rolls of Kodachrome with various degrees of stripping were coated to Recordak emulsion and processed, after which stripping results were found to be OK. This then is a possible outlet for Kodachrome that shows inferior stripping results.

Dr. Eilers stated that it had been decided not to release any more Kodachrome, regular product, for coating until results of testing had been heard from, in view of stripping troubles being encountered. Dr. Nadeau's immersion experiments on #54 machine were not passable for quality, however, this is to be repeated on #53 machine where he believes the quality will be satisfactory. Dr. Eilers stated, however, that 53 machine runs higher waste than on 54, and should therefore be considered a temporary move to get out of trouble. Mr. Babcock suggested putting a 70% ppt. acetate undercoating beneath the x1000-A gel acetate sub to improve stripping, since experiments had shown that 70% ppt. value acetates were easier to stick with single gel sub type than 90% ppt. value acetates.

Kodalith

It was reported that the most recent coatings of Kodalith from #54 machine were coming OK for stripping, good for lines and mottle. Likewise, samples of wide Kodalith, recent coatings, from #222 machine where new shallow pans are used are testing out well.

XRay

Mr. Babcock reported on stripping results where a series of subs ranging in strength from E to HI for Safety Blue XRay was run in order to insure us that we were still operating in a good zone for

stripping. It was noted that every sample was passable for stripping down to HI (which was the weakest sub. O was also noted that the brittleness was about the same thru the entire series. This is undoubtedly caused by the fact that heatefafter results show solid OK for all samples, whereas the tear test varied from OK to Peels Hard. Mr. Babcock suggested that vigorous adhesion of the emulsion to the base on heatefafter test might be modified by returning to 2 x gel and by the application of cooling water on the regular sub hoppers. It was agreed to try a roll subbed in this fashion to see if anything promising in brittleness could be picked up. (Reference. R.C. Letter #52358)

Another series of subs ranging from DE to H was about ready to be run with special nitrate Uct x-1296 which had alcohol solubility of 65% in place of standard (85%). Stripping and brittleness results will be reported on at the next meeting.

SUBpump

Mr. Babcock noted that the silver sub pump being constructed was about ready for use, and it was decided to have it installed on one of the Cine nitrate machines, and put in operation as soon as possible as a preliminary step to the elimination of variation in the sub flow, which has always been a potential, if not actual cause of stripping trouble. It was pointed out that Mr. Armstrong's objection to the exposed coil had been overcome, and the the coil being used on this pump was now enclosed.

Spicer DuPay hopper

In connection with the subbing of XRay, it was again ppinted out that a very appreciable amount of plasticizer was found in the sub draw-off and sub bead, and this is considered detrimental to subbing and possible reason why short stripping tests do not behave in a similar manner to regular full length coatings. Dr. Nadeau stated that work on this method of subbing would be pushed as soon as the drum had been installed in building #19. Mr. Babcock drew a sketch of a Kodak hopper which featured the use of a squegee against the sub roll, which would remove the excess sub after having passed thru the bead. Such an arrangement, if practical, should materially reduce the plasticizer content in the sub hopper itself, and it was agreed to investigate the possibility of including this feature on one hopper for test.

Sub Filter

Mr. Babcock showed a filter cloth which had been used on an In-the-line-filter- purchased from the Creamery Package Co., the filter having been installed on a circulating system and operated for 36 hours. A considerable quantity of fine particles, which appear to consist chiefly of metal turnings and sand, was noticed on the outside of the filter. It was considered that this type of filter would give good satisfaction on the circulating systems in removal of this foreign matter from the systems during the subbing operations, and it was agreed to investigate the possibilities of obtaining more of these filters, preferably made of nickel thruout. It is our understanding that the filter used was made of brass and afterwards tinned.

GSB:S G.S.Babcock

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SUB CONFERENCE OF May 7, 1937

Safety Cine Positive - DS Gel.

The first coating of Cine Safety using DS Gel had high printer rating and slightly higher speed in the case of the DS Gel experiment. This seemed unusual, so the experiment was repeated. Mr. Klem has produced original and 6 day Cinex tests, and actual tests were examined by those at the conference. It was agreed that the experiment and the check both look alike. Emulsion numbers are as follows:

5301-587-1 check

5301-587-2 DS Gel experiment

Five weeks keeping test has been underway for sereral weeks, and will shortly be reported. It was agreed to wait for the results of the 5 weeks tests before starting an approval for the use of DS Gel on this product.

Kodalith in Building #53

In order to produce a wide Kodalith which would have better flatness and low shrinkage for work in connection with Aero Mapping by the Federal Government, production was started on .005-1/2 and .008-1/4 from AP2000 dope in building #53. This product also according to Eilers gave shrinkage of 0.37 and 0.17 which is lower than the LS Portrait and 33 and 34. In order to accomplish the subbing, a Uct containing 3% solids with methyl cellosolve was used and this followed directly by a gel sub. The question of the brittleness was brought up. It was feat that brittleness of this product would probably not be any worse than the regular coating. It was felt that more stripping trouble might be experienced with the Pelloid than with the emulsion in the above process. It was stated that Ortho emulsion with brown gel Pelloid would be used for coating this type of material. Dr. Nadeau cautioned that Mr. Klem had reported C sub and gel sub applications left bad stain when this type of emulsion was used, the manganese dioxide in the gel not being the cause for trouble in this case, but rather the dye in the emulsion. Dr. Nadeau felt that if half tone emulsion could be used that results would be OK for stain. Mr. Seel stated that as long as we duplicate previous sample of regular LS Portrait originally delivered that the product would probably be satisfactory.

Safety X-ray

It has been determined that In-the-line-filter, secured from the Creamery Package Co., installed in Uct circulating wystem on #47 machine would operate for one week, before the filter has to be changed. Another one has been ordered for further resting, and Mr. J. Baybutt is having one made up out of nickel.

Mr. Babcock showed stripping and brittleness results of tests made on class #21 Safety X-ray where 65% alcohol soluble F cotton was used in the Uct vs. 85%, which latter is standard at the present time. It was noted in comparison of results that in the cases where the stripping was "Vsp" and "OK" both Ucts gave satisfactory stripping down to GH sub beyond which results of "SP" and "PeelsH" were obtained. The brittleness for comparable regular subs was somewhat higher in the case of the 85% alcohol soluble material. It was agreed that in order to prove this out correctly, it would be necessary to get one machine on steady production for a period of time, and it was decided to go ahead with this. (Ref. for emps. Letters 52358 and 52405).

Building #29 has been having trouble with scrapings on the emulsion cups, and also the sheets tend to stick together in the alley on X-ray coatings. In order to help this situation, we have delivered 20 rolls of Safety X-ray using 1/2 hardner in the NS Gel instead of 1/4. Mr. S. Wells has reported that no noticeable improvement was found with these 20 rolls, but requested 20 more for further testing. He states that there is still no noticeable improvement in the 2nd group of 20, also reporting that static buildup during the unwinding of the rolls for the #1 coat were about the same for both types. Two of the special rolls showing static around the edge against two of the check rolls, however due to the static situation, and ten more rolls have been delivered to Mr. S. Wells for futher testing in connection with electrostatic accumulation.

Testing of NS Gel

Mr. Babcock stated that present practice in testing NS gel was first to coat one roll and have this tested for incubation and step tablet with Xray emulsion. If satisfactory, thereafter 5 rolls were coated and tested in the same way. If these 5 rolls were satisfactory the NS gel could be accepted for use in making NS Gel solutions. Mr. Babcock stated that Mr. Bruce supplies us with samples of NS gel that have previously been tested and found to be OK in both Paper Department and Emulsion Coating Department. Inasmuch as this previous testing has been made before wex receive the batch, it was agreed that 2 rolls should be coated and put thru the regular incubation and step tablet test after which if OK results were secured the batch could be accepted for use.

DS Gel on Safety XRay

Mr. Babcock stated that further results were secured on #47 machine rolls that have been on DS Gel for 2 months as follows:

5120-494-12	47-3240	DS Gel in sub
5120-494-16	47-3212	Check

(a) Three weeks Curl and Buckle

Experim[illegible] some better than check. O

(b) Four weeks Tropical

	Top	Center
Exp.	.04	.06
Chk.	.10	.05

(c) One month in Summer Room

Exp.	.03	.03
Chk.	.03	.03

It was agreed to follow up the approval sheet on the way thru at the present time which calls for more machines of Safety XRay at the rate of one machine every two weeks.

AP2000 Portrait

It was noted that a decided improvement in lines was secured since going to the use of methyl cellosolve in the Nitrate Uct and C sub.

Mr. Babcock noted that brittleness of AP2000 tests had improved very remarkably on the samples roll coated May 2, 3, and 4, results being about 60% free of brittleness as against 10% to 20% on previous rolls. It was noted that this change did not come in with the change to Methyl cellosolve Uct. It was agreed to present these figures to Dr. Carlton and Mr. S. Wells to see if they could discover some feature of the emulsion coating which might have caused the difference.

TB Base

For two weeks we have made no TB Normal Stripping Film on #25 or 26 machines because the last glue coatings made in building #29 were brittle. We have been filling the Emulsion Coating requirements out of the stock we have built up and we feel there will be a shortage of support in about 4 weeks. At that time we may have only one machine to make TB Normal Stripping Film on because it is likely that the other machine will be in use coating the new Super Speed Stripping Film, development of which is about completed.

The quality of the support made on #54 machine and subbed with use of immersion pans is considerably better than that subbed with KP hopper. The KP hopper subbed material in general shows longitudinal comb lines and there is about 50,000 ft. of this material which we have been unable to test because building #29 was unable to coat glue on account of the brittleness trouble.

One roll of the support from #54 machine was used for TB Normal Stripping Film experiment on #26 machine and neither Uct nor C sub could be successfully applied on this support because the support curled very badly and tear-offs occurred repeatedly. We have previously been able to apply either Uct or C sub on Kodalith base and Mr. Couch thought the difference noted on the roll from #54 machine might be due to the fact that #54 machine support is not being cured out as much as the other support was.

GSB:S G.S.Babcock

Sub Conference of May 14, 1937

Kodachrome

Mr. Babcock showed a test tube containing a sample of Kodachrome base from which the emulsion had been stripped away. Acetone had been added and the acetate had dissolved leaving a thin gelatinous film which was undoubtedly the sub layer. This indicates that Kodachrome stripping with which we have been troubled recently is occuring between the sub layer and the emulsion. Still another test where the emulsion was stripped off and allowed to float in enzyme solution, after which, no insoluble cotton film could be observed and further check with the sub layer does not come off with the emulsion but rather sticks to the base.

Kodachrome tests coated on May 9, four tests were had out of 11 coated. On regular coating 231 only 2 rolls out of 11 were passable.

Mr. Babcock reported that a 6 ft. stripping test had been completed using another series of aceyate cottons for blend #2, and that this test had come thru OK for reversal stripping. When blend #1, therefore, runs out we are in a position to go to the use of blend #2 for regular production.

A tabulation of the properties of the acetate cotton used in the Kodachrome sub follows:

			PPt.	Vis.	%Acetyl
#1	Original cotton		61	31	38.7
#2	Blend #1	83977-78	68	27	38.7
	(Now being used in x1000-B)	84017-18	68	24	38.8
		84098-100	67	26	38.5
#3	Blend #2				
	(Next blend to be used as	83979-80	65	26	38.6
	x-1000-B)	84017-18	68	24	38.8
		84099-100	67	26	38.5

It was noted that an experiment where C sub was first applied to the base followed by x1000-B gel-acetate sub showed OK for wet stripping. Also another experiment where acetate Uct was used in X1000-B showed only very slight wet stripping. Another test similar to X1000-B but containing larger percentage of gel and without any Uct washed off in the wet stripping test. Dr. Eilers stated that some great trouble was being noted on Kodachrome machine due to the fact that C sub had been added to the regular sub application in the

air section at front end, and he stated that he thought orsat reading could be dropped by slowing down the fan to get a lower brine temperature after having dropped the sub hoppers, and it was decided to try this in order to save shutting down.

Dr. Nadeau reported that 3 month tests where Santolite was used in the Uct for Kodachrome coating were showing O^{k} and that the 6 month test would be out June 20. Dr. Kilwrs suggested that a roll should be made at once so all the results of this roll could be coming thru and we would have a good preliminary start on testing. It was decided to make a 1000 ft. roll and have same coated to emulsion.

It was noted that the use of C sub under X1000-B was giving some slight bloom trouble on the Kodachrome machine, but it was felt that this bloom cleared up when the emulsion was coated.

Safety XRay

Samples of Safety XRay, which were known to be good for desensitized spots, also samples known to be bad for desensitized spots, were coated to emulsion by Dr. Staud, emulsion coating being made to both faces. These were then incubated for 3 days and processed, and it was noted that many white spots could be noted in the samples known to be bad, whereas in the other samples no characteristic white spots could be noted. It was felt that this might be a good test from the standpoint of economy in testing, and it was decided to see whether these white spots actually went thru to both coats of the emulsion which was charac eristic of our recent transparent spot trouble.

Dr. Nadeau noted that the set of tests where 2 x gel stock was used on Safety XRay indicates that as subs were weakened we could go down to poor dry stripping without being in trouble on wet stripping. This should be a method improving brittleness. Mr. Babcock noted that in order to be seccessful cooling water should be applied to the sub hopper jacket and the outlet maintained at approximately 90F for regular running. It was decided to coat 2 rull rolls using 2 x stock including water on the jacket.

Cine Negative Grey

Ten rolls of Cine Negative Gray had been delivered where DS gel was used in the sub, and Mr. Klem has arranged for these rolls to be coated along with other check rolls containing regual r gel in the sub. It will be remembered that 2 previous rolls of Cine Negative using DS gel, resubbed, showed OK for emulsion tests, stripping and brittleness also being OK.

Film Pack

#27 machine is now using 60% stock in the sub which today shows OK for machine blisters. It will be remembered that 2 rolls previously coated were also OK for blisters and tested OK for stripping, brittleness and emulsion quality. Following these, 5 rolls have been coated and they are just coming out of the emulsion now, and stripping results are expected today. Mr. Seel has agreed to run one machine on this new type common sub for NC and Film Pack until further notice.

Kodalith in Building #53

The first 10 rolls of .0085 Kodalith coated in building #53 showed bad for wet stripping. 3% nitrate Uct was used followed by E strength gel sub. It should be noted that 65 % alcohol soluble F cotton was used in the Uct which is somewhat lower than our previous standard which has been running around 85%. 65% alcohol soluble material was chosen by Dr. Eilers because it would be better for haze and surface appearance. Mr. Babcock stated that stripping occurred between the emulsion and the Uct and not between the Uct and the base.

It was noted that one test from #33 machine using 3% of 85% alcohol soluble F cotton followed by C sub and DE150 showed OK. The obvious cause for failure therefore in building #53 seems to be due to the lowering of the alcohol solubility and the omission of the C sub. It was noted that this material could be resubbed and this work is being started.

Some .0055 Kodalith has also been delivered using 2.5% of 85% alcohol soluble cotton followed by gel subs BC200 for the Pelloid side and F200 for the emulsion side. It was noted that one test of this type of subbing would be coated over the coming weekend.

Aero

Mr. Babcock noted that the stripping on Nitrate Aero was still not as good as should be, and it was noted that when the new #12 machine was finished that we would be able to apply C sub and gel sub, in which case the stripping trouble would be taken care of.

T.B. Stripping Film

It was pointed out by Dr. Eilers that the only type of machine to produce a good grade of T.B.Stripping Film base as well as Kodalith was one like 53. It was decided to draw a pencil sketch of the good features of 53 machine with an idea of converting another machine into a similar type for Kodalith TB base production inasmuch as #53 would be largely required for experiments.

GSB:S

G.S.Babcock

SUB CONFERENCE OF MAY 21, 1937

Methyl Cellosolve

A general discussion on the use of methyl cellosolve was entered into, inasmuch as it had been decided yesterday by Mr. Seel to discontinue the use of it in the Uct being used on LS AP2000 Cut Sheet machines, because of information received by Mr. Marcus from the Carbide and Carbon Chemical Corp. to the effect that when methyl cellosolve was stored in ordinary steel tanks, particularly for long periods of time and at elevated temperatures, that there was a tendency for peroxides to form, which in turn increased the acidity and caused slight darkening. It was noted by Mr. Babcock that methyl cellosolve had been used in small quantities for the last 4 or 5 years, and when this material was first received, it was delivered in iron drums in which the methyl cellosolve showed a tendency to darken in color. Recently the Carbide and Carbon people have been delivering this material in galvanized drums which appear to have no effect on the color of the solvent whatsoever, even on long time standing.

The use of methyl cellosolve is very interesting in sub making because of the fact that it is a good solvent for cellulose acetate, and at the same time is more compatible with gelatin than is acetone. This means that gelatin subs made up with methyl cellosolve are much more stable than when acetone is used. It has also been demonstrated by Nadeau and Eilers that the use of methyl cellosolve in nitrate Ucts in place of butyl alcohol is an improvement from the standpoint of haze and lines.

It was noted that difficulties were being experienced in the distillation plant in the recovery of methyl cellosolve, inasmuch as it forms a constant boiling mixture with water which is .3degrees below that of boiling water alone and is very difficult to separate from water. A method proposed at the present time is to add ethylene dichloride to the water-methyl cellosolve mixture, and heat the solution to boiling. In this fashion a steam distillation with water and ethylene dichloride is formed which concentrates the residual methyl cellosolve. Details of this processing have not, however been worked to date and methyl cellosolve is being thrown away with water from the stills, and the loss to the E.K.Co. is approximately $6,000.00 a period when used on the LS Portrait machines. It was questioned whether this loss corresponded with the saving in the improved quality of product where methyl cellosolve is used.

28 days

It was pointed out by Dr. Nadeau that the amount of peroxides formed in methyl cellosolve must be very small, inasmuch as emulsion tests on Portrait and X-ray where it was used have been reported OK for quality, which would not be the case if an appreciable amount of peroxides had been present.

It was finally decided that we should return to the use of the old type Uct, but in the meantime test out various other high boilers; e.g., butyl adetate, iso-propyl acetate, secondary butyl acetate, ethyl lactate, diethyl ketone, etc. Mr. Seel also asked to have one experiment run where the butyl alcohol was omitted from the solvents where the cotton was dehydrated with 95% ethyl alcohol in the regular formula.

Mr. Seel suggested the use of a small amount of camphor to eliminate bloom trouble if necessary. He also stated that if ~~xxx~~ it was necessary, he would prefer to use butyl acetate which had been used before at Kodak Park than to continue with methyl cellosolve in the light of our present knowledge of this high boiler.

Mr. Seel stated that 3 day incubation tests should be secured on the new high boilers before any action was taken.

It was pointed out that methyl cellosolve had been used for some time in Mr. Slack's backings, also in Super Speed Stripping film. Dr. Carver suggested that he would have one of his men test some samples of methyl cellosolve that had been standing around for some time, for the presence of peroxides.

L.S. Sut Sheet

Mr. Wells inquired when the London X-ray would be coated, and Dr. Eilers replied that this would be started tomorrow, after 2 rolls of LS AP2000 Kodachrome are coated for Mr. Cook; this requiring special resin threadup. Eilers stated that after standing this material was worse for sub streaks, and therefore only 2,000 ft. should be coated. Dr. Nadeau inquired if the special resin threadup could not be continued in LS production, but Eilers replied that when we changed from resin threadup to standard threadup we got out of some stripping trouble on Portrait.

Kodachrome

It was noted that the most recent coating 233 to date was showing satisfactory wet stripping, this coating used C sub under the gel acetate sub. In general the stripping on Kodachrome had improved during the last week.

Kodalith in Building #53

It was noted that stripping on the base made in building #53 for Kodalith was so bad that this material had to be resubbed, and that after resubbing the stripping was satisfactory.

Safety Cine Positive - DS Gel

Mr. Babcock reported that the results of 5 weeks tests on DS Gel in Safety Cine, start and finish, had been received from the Research Lab. and that no apparent differences in emulsion quality were noted. It was decided to get out an approval sheet to go to the use of DS Gel on Safety Cine Positive.

N510 Cine - DS Gel

Mr. Babcock reported that 5 weeks tests on N510 coating of 2 full rolls had come thru, and that Research Lab. had reported their strips had no difference between the experiment and the check. It was decided to put this information in an approval sheet to go to the use of DS Gel on one machine coating N510 Cine.

SUB CONFERENCE OF MAY 28, 1937

Filtration Experiment

Mr. Babcock reported on results of filtration experiments in which Filter-Cel, as made by John Mansville people, was used as a filter medium. The method employed was to drop some of the Filter-Cel into the solution to be filtered, after which solution was stirred and recirculated thru a plate and frame press until the filter came clear when the flow was diverted into a receiver. It was found that C sub could be filtered quite nicely by this method with a pressure not exceeding 25 lbs. The filtrate is noticeably clearer than before filtration and appears to be similar to the filtration we have produced in the past by the use of Karl Kieffer filter and paper pulp. Another experiment in which attempt was made to filter the gel acetate sub used on Kodachrome, resulted in the production of a filtrate which was water white in appearance, whereas a noticeable opalescence was present before the filtration was started. It was necessary to increase the pressure to 50 Lbs. before this filtration could be effected, and after taking the press apart there appeared to be a considerable amount of gel mixed in with the filter medium. Subsequent analysis of the water white filter disclosed the fact that the acetate had filtered thru, but the gel had been retained by the Filter-Cel. A sample of the Filter-Cel was delivered to Mr. Schoen for Spectroscope determination, and he reported the presence of aluminum, iron, magnesium, silicon and sodium. Inasmuch as the filter medium has a light tan color, it was suspected that a trace of a metallic salt might be present which would interfere in the case of gel sub filtration. It was decided to try and obtain a filter medium that was chemically treated for the removal of metallic particles and soluble salts, also to include calcining process to remove traces of organic material.

Mr. Babcock raised the question as to whether an opalescent gel sub could be cleared up without the filtration of the gel, inasmuch as the dispersion of gel itself inherently would cause opalescence in the presence of small amounts of water. Dr. Wilwrs inquired whether some soluble salts in the filter medium might have precipitated out of the gel, and Dr. Carver suggested puyting some Filter-Cel in the unfiltered solution to observe the effect. Theoretically, salts in subs 1.5% gel, and 1.2% acetate. Actual presence of salts after filtration (a) 1.18% (b) 1.19%.

X-ray

Mr. Babcock submitted the following table of sub strength vs. alcohhl solubility of the F cotton used in the Uct as follows:

Jan. 1, to April 4	Sub G and GH	Al.Sol of F cot. 88-90%
App.4, to May 9	" FG " F " " " "	85%
May 9, to May 27	" F " EF " " " "	80%

Brittleness results are about the same. The sub strength had

to be increased to hold the sub layer to the base & the alcohol solubility decreased.

It was decided to go ahead with the use of 2 x stock for sub on Safety X-ray, also using jacket water to cool the sub to 70F. It was pointed out that two previous rolls, 49-23 and 49-24, where EF200 was used were OK for stripping, the brittleness being zero, which is what we expected inasmuch as we want to be sure we do not get into wet stripping. It was decided to get the tests together and start an approval sheet. Inasmuch as this type of sub has been used in the past for Safety X-ray, it was not considered necessary to run incubation tests.

Mr. S. Wells reported from building #29 that the last 10 special rolls of Safety X-ray using half hardener instead of one quarter, showed no improvement as far as cup trouble and sticking together of the emulsion coated surface was concerned. Likewise no difference in static properties was found.

Dr. Eilers suggested that the exhausted fixing bath tests for blisters should be run on class #25.

Methyl Cellosolve

It was pointed out that butyl acetate was not as good a high boiler in the Roll Coating as methyl cellosolve, inasmuch as the appearance of the support on the AP2000 machines where butyl acetate was used is not as good as when methyl cellosolve was used. Also butyl acetate is a non solvent for cellulose acetate and only a fair solvent for cellulose nitrate, and is more compatible with gelatin in gel subs. The elimination of the butyl alcohol from the Uct was worse for lines, but the haze was better. The butyl acetate was then tried out in the Uct with poor results from the standpoint of haze, following which we returned to the regular Uct containing 5% butyl alcohol.

It was decided that it would be a good plan to contact the Carbide and Carbon People and get their opinion on peroxide formation in methyl cellosolve, inasmuch as these people have considerable knowledge of this product which they might be willing to pass along to use. I t was decided after some discussion to takl to Mr. Kocher and have Mr. Marcus write a letter to Carbide and Carbon Co. to see how bad the peroxides formation might be in methyl cellosolve as compated with other solvents. Also what steps could be taken to eliminate or discourage peroxide formation during distillation and recovery.

It was reported that the experiment where camphor was added to the nitro cellulose Uct resulted in heater-after stripping.

New Type F cotton

Dr. Eilers suggested that if we could get a nitrate cotton of F cotton type which would be soluble in ethylene di-chloride or at least would be compatible so it could be put in the film base, it might be an improvement from the haze standpoint. Mr. Wells suggested that Mr. Folwell should be approached on this matter.

Tech. Portrait

Mr. Babcock reported that an experiment was on the way thru where DS gel had been applied in the sub on Tech. Port. from PR116 dope.

Cine Kodak and Kodachrome

Mr. Babcock reported that stripping on Cine Kodak had been falling off recently on test pieces. Mr. Wells stated that Kodachrome was showing some stripping on heater-after tests. Dr. Kilers said that the new method, gel acetate sub followed by gel sub, looked very promising, and stated he would like to get started on this method of subbing as soon as possible. He also stated that Mr. Klem was running tests to try ~~thm~~ to transfer Jet Cine Kodak to Super Pan type made with X1000B sub. He is also running tests to transfer Cine Kodak made with CAC and X1000B to Recordak.

Mr. Wells spoke about a new black Jet Uct proposed by Dr. Staud to be coated between the base and the emulsion on Cine Kodak sca tings. This would be an advantage to the Roll Coating Dept. because no transference troubles would be experienced. It was pointed out that universal subbing could probably be accomplished at the same time for Kodachrome, Cine Kodak, Cine Safety, etc. which would be a saving in waste.

Translite

A recent coating of Translite has been checked for brittleness and it has been found that it is more brittle than Kodalith on unprocessed material, and after processing it is practically 100% OK for brittleness. Stripping is very good on recent coating, nothing worse than "Vsp" and "Sp".

NC and Film Pack - Common Sub

100 rolls have been coated where 60% stock in the sub has been used, this material all being called "Film Pack". Only 4 rolls out of 100 showed blistered. These blisters are very light, and the cause was traced to an over-heated dryer. When this condition was corrected the blisters disappeared. Mr. Paddock is pleased with this production and states they have all the Pan they need. Stripping is also OK. Mr. Babcock stated that when tests from the first regular coating had been heard from that results should be included in an approval sheet to start another machine on this method of subbing.

Cine Negative - DS gel

[redacted]

10 rolls have been coated to emulsion, and tests are underway.

Imbibition Solution

Mr. Babcock suggested that the imbibition solution used in building #53 for class #9 product might be made in building #45 and delivered thru a glass line equipped with a strainer over the outlet end. This method of delivering the solvent solution to building #53 would be more economical than trucking the material over in cans. It was felt, however, that class #9 product would shortly be out of the picture, at building #53 and that this suggestion might, therefore, be deferred, at least for the present.

SUB CONFERENCE OF JUNE 4, 1937

Kodachrome

Stripping tests on Kodachrome, subbed with C-sub and followed by acetate-gel sub and gel wash, were showing OK on experiments during the past week. Also the regular product without the gel wash is showing satisfactory stripping. It was noted that in the glyptal gel experiments, better stripping was produced when a straight gel sub was applied over the gel glyptal combination.

In connection with the gel wash, Dr. Eilers reported that the expertment using .6% gel stock looked as good as .5%, and stated if these rolls continued to be alright during the following week that all Kodachrome will be switched over to .6% amount.

16 rolls of Kodachrome subbed with gel-acetate sub were transferred to a Recordak coating and they came out solid OK for stripping. This is an outlet for bad rolls of Kodachrome, even when subbed with gel-acetate sub.

NC - FP - Common Sub

Mr. Babcock reported on the results of 3, 6, and 9 day sensitometric results from the Research Laboratory, in which the results were substantially the same for the experimental sub with 60% stock as they were with sub containing regular amount. Stripping is coming solid OK. Results were also reported on 9 months keeping tests where 80% regular amount of stock was used, and Research Laboratory reports there is no difference between the experiments and the check.

It was suggested by Dr. Nadeau that it would be practical to have Tropical incubation tests for stripping in the high humidity room before starting an approval sheet for another machine to go on this type of subbing.

Zone of Stripping

In view of the fact that the recent stripping noted on the Kodachrome occurs at times between the sub layer and the emulsion, and at other times between different layers of emulsion, Dr. Carver suggested that Testing Department, wherever possible, should mark where the zone of stripping occurs when they amke their report on stripping. It was pointed out that at times it would be difficult to do this particularly where two or more layers of gel were applied, however, it was agreed to take this matter up with Mr. Rupert to see if it would be possible for him to give us any further information regarding the zone of stripping than we were obtaining at the present time. It was pointed out that in certain cases where a nitro-cellulose Uot strips away from the base that this zone can be determined in the labora tory by floating a piece of stripped-off emulsion on hot water or enzyme solution.

LS AP2000 Cut Sheet

In connection with haze troubles, it was pointed out that when we were in trouble with haze last fall, the Uct showed a cloudy condition and was difficult to filter, whereas at the present time there is no trouble with the filtration and the Uct appears quite clear. Nevertheless, haze trouble to some extent is with us at this time. Dr. Eilers stated that we should endeavour to make use of 5% methyl cellosolve in the Uct and C sub in an effort to improve the haze condition. He stated he had discussed this matter with Mr. H. Paddock, and that it seemed likely it would be an advantage from the standpoint of dollars and cents to go to the use of 5% methyl cellosolve, even though none were recovered, due to saving of wast of product.

London Blue X-ray

Dr. Eilers reported that Mr. R. Baybutt has complained that they have 3,000 lbs. of scrap on hand which could not be readily recovered due to the difficulty of extracting the Gentian Blue, whereas this trouble was not experienced with the old type Spirit Blue. It was pointed out that Gentian Blue is not water soluble which might account for some of this difficulty. However, Dr. Nadeau pointed out that #12 solvent dissolves nitrate Uct and the dye from PSS4 base and it is difficult to see why this same condition would not exist with AP2000 base. He stated he would talk with Mr. J. Reid about this question. methyl alcohol

Safety X-ray

An approval to go to the use of DS gel on the X-ray machines at two weeks intervals has been signed, and we can, therefore, proceed with this program at once.

A letter has been received from Mr. Rupert requesting that we start off another series of X-ray rolls of class #25 product to test for blisters, the rolls of base being collected at six week intervals. We will start to collect these rolls at once. The number of the first roll in this series, which was coated May 14, is 56-9948.

Dr. Sheppard's New Gel

Dr. Carver inquired if anything had been done with Dr. Sheppard's new gel, and stated that he would like to get some tests underway for long time keeping. Dr. Nadeau replied that he was anxious to get some tests and believed the chemical could be cut down quite a bit.

Robo Tech.

Mr. Wells asked what the effect would be on dye retention to make Robo Tech. in building #53 one time over the machine without any water-boxing treatment, inasmuch as recent experiments had shown that low shrinkage product could be made this way. It was reported that dye retention depends largely on the sub strength and the chances are if this were regulated we would be alright. On Nitrate Portrait the dye retention feature was improved by weakening the strength of the sub. Arrangements will be made to have some of this product tested for dye retention and comparison made with standard production.

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SUB CONFERENCE OF JUNE 11, 1937

Hazeon AP2000

Mr. Folwell displayed bottles containing 4 different F-cottons dissolved at 15% concentration in (1) methyl cellosolve, (2)acetone, (3) 50-50 methyl cellosolve and methyl alcohol. It was noted that the cottons dissolved in acetone were very viscous, although Mr. Folwell stated that a trace of water added to this solution would bring marked reduction in viscosity. The solution of methyl cellosolve and methyl alcohol was nicely soluble, and the solution of methyl alcohol alone was even more soluble.

Mr. Babcock reported on Laboratory test in which some support subbed with Uct and C-sub and which showed haze was taken and various gel subs applied with the purpose in mind of removing the hazy condition. The thought in mind here wqs that this might be a convenient method of getting out of haze more quickly on the machine. The gel subs used were: (1) check, (2) check with 10% methyl cellosolve, (3) check with 20% methyl cellosolve, (4) check with 40% methyl cellosolve. Considerable haze was noted on all samples except the one containing 40% methyl cellosolve which seems to be much clearer than the check. This is an indication that the haze already in the Uct and C-sub can be redissolved and cleared up to some extent by the use of proper solvent in the gel sub. It was agreed that experiments along this line should be tried on the fegular coating machine. It was also pointed out if haze could be controlled by the use of nominal amount of methyl cellosolve in the gel sub that considerable less quantities of methyl cellosolve would be required successful operation.

It was noted that Mr. Seel had given permission to turn temporarily to the use of 20% methyl cellosolve in Uct and 15% methyl cellosolve in C sub on AP2000 machines until a satisfactory substitute could be found. It was decided that the next shipment of methyl cellosolve should be received in galvanized drums similar to the previous shipment, inasmuch as no galvanized iron tanks were available for the storage of this material at the present time.

Dr. Eilers reported that an approval sheet was coming thru for permission to make a 1000 lb. batch of F-cotton with 11.5% nitrogen content which was expected to show some improvement in haze.

A considerable discussion ensued on the possibility of using hot washed F-cotton in place of cold washed. It was decided that this would be a better cotton for haze characteristics, however, inasmuch as more stripping trouble has been noted from the hot washed type cotton, it was more or less agreed that this remedy should not be taken at the present. It was pointed out that class 21X-ray, using hot washed cotton in the Uct was a failure, however when cold washed was used the stripping was satisfactory.

During the past week several experiments were run in order to prove whether the individual cottons or mixture of the cottons used in the Uct were causing haze. It was pointed out that a low alcohol soluble cotton and a high alcohol soluble cotton being taken separately would be nicely soluble in the Uct solvent, but if they were mixed together the compatibility might not be such that good solubility would be secured. In order to prove this out 3 rolls each were run using (a) high alcohol soluble F cotton, (b) low alcohol soluble F cotton, (c) high and low alcohol soluble mixed. After these rolls had been run, it was decided that no particular difference in haze between the 3 types could be noted. When the haze characteristics of the above 3 types of subbing were compared with the regular Uct blend, which contained 2 of the above mentioned cottons, it was noted that the Uct blend was worse for haze. This might indicate that the mixer at building #52 needed cleaning, and it was decided to have this done. Mr. Folwell reported at this meeting that the cleaning had been finished.

Mr. Folwell stated that hot washed cotton gave a better yield and was not as gelatinous in character as cold washed. He mentioned another cotton experiment where broken down wood pulp was nitrated giving an F cotton that had some sticking properties, samples of which were sent to Dr. Nadeau. He also stated he knew of no F-cottons that possess solubility characteristics in ethylene dichloride.

DS Gel in Sub on PR115 Cine

Mr. Schoen has reported on the result of emulsion evenness as determined by densigrams run on 18 rolls of 1301-185. In this series the odd numbered rolls were subbed with DS gel, whereas the even numbered rolls were subbed with regular gel.

Mr. Schoen concluded as a result of the inspection of the densigrams, "there is very little difference between the experimental subbed rolls and the regular rolls."

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SUB-CONFERENCE OF JUNE 25, 1937

Static on Safety X-ray

A discussion of the blotch static on X-ray was gegun was noted that temporarily it will be necessary to apply a heavy coating of NS gel in building #29 to overcome this trouble. Mr. Wells stated that the scrap was not as high as it had been in the past, and it was theorized that the conductivity of the base was lowered by reason of the lower ash content. Mr. Babcock stated that he had run some tests some time ago where salts were added to the regular sub, which at that time were designed to improve brittleness, and he suggested that a salt might be incorporated with the regular sub to improve the general conductivity of the base. He also suggested using chemical #36 which is the same salt now used in NS gel Uct, this salt being composed of a monovalent anion can be introduced into the regular sub up to 70% wt. of gel whereas other salts with a high valent anion could only be used up to 1 and 1/2% wt. of gel.

Mr. Wells stated that he believed that a great many of the stripping static problems depend on chill box temperature, and Dr. Carver stated that he thought it would be worth while to start some experiments on the laboratory scale to determine the effect of time and temperature on these factors. Mr. Wells suggested that the 18" machine could be used for these experiments.

It was stated that Mr. Bahr believed that some static from the idlers in building #29 on X-ray was caused since the sub was strengthened because of wet stripping.

Mr. Babcock read a letter from Mr. S. Wells in which he stated that experimental rolls from #56 machine using 65% alcohol soluble F cotton in Uct showed up worse for static than the regular checks which were running in the neighborhood of 80 and 85% alcohol solubility. Attention was also called to the fact that the alcohol solubility of the regular F cotton Uct blend has dropped from 85% first part of May to 78 to 80% at the present time, and it was wondered if this would have anything to do with static troubles.

Dr. Nadeau wondered whether therr was any correlation between the support smoothness that would account for static variances, and Dr. Eilers replied that #47 machine has a rougher surface than the other machines as visualized at the windup, and that Mr. Schoen reported there was more intimacy between layers on #47 machine than on #46 machine. It was noted that X-ray from #46 unwound well and showed none of the objectionable static trouble X-ray from #46 has qyite a buildup charge on the outside of the roll - near the core there was no charge. Mr. Babcock stated that about two weeks ago all the F cottons used in the blends had alcohol solubility of approximately 80% which corresponds fairly well to the time trouble became bad. Previous to this time F cottons with a

greater variation of alcohol solubility had been used to produce an average of 80% and it was wondered whether the high alcohol soluble cotton might be a help in static.

Stripping on X-ray

Mr. Babcock showed the results of some stripping tests on London X-ray using M1-2000 dope in which it was noted that syrong regular subs such as C and D showed bad wet stripping and leaves edges, whereas E, F, G, and H were OK. It was also noted that E sub on regular tests were showing some wet stripping and it was decided to weaken the sub on this machine to EF in order to improve conditions. On the C and D experiments separation occurred between the sub and emulsion.

Elimination of Methyl Cellosolve

Mr. Babcock stated that he had successfully filtered a 3000 lb. batch of Nitrate Uct containing 3 and 4% solids thru the Karl Kieffer filter, and that the Uct was much improved in appearance, being entirely free of haze and cloudiness. This Uct was made up according to the old formula (not containing methyl cellosolve) and when used on #55 machine gave a support which was free of haze, and passable for quality. It was agreed we should push along with the production of this type of Uct with the idea of eliminating methyl cellosolve, which, at the present time, is causing us to lose about $6000.00 per month in view of our inability to recover same.

Kodachrome

It was noted that the most recent coating was showing dry stripping, about 32 rolls having been held by Mr. Rupert. Stripping ranged from Lp to Peels LE. It was noted that the reversal, wer, and heater-after test results for the above rolls were all passable. Dr. Nadeau stated that Kodachrome stripping was showing residual stain on the base indicating that the emulsion was separating from the sub layer, and sub layer was sticking to the base. He indicated that the gel wash might help the stripping trouble, but failed to see why the CAC should help. It was pointed out, however, that Kodachrome production was in a bad way until the C sub was started, and then we got 150,000 ft. OK. Dr. Nadeau stated that the C sub and Gel sub combination is causing considerable trouble from the standpoint of quality on the 16mm. Kodachrome. It was finally agreed to run some more experiments with and without the application of a C sub, and arrange to have test pieces alternating in the emulsion coating process in order to finally prove whether the C sub application had any advantages, and also to offer relief on present stripping trouble.

Dr. Nadeau stated that he had been working with the use of salts in gel subs during the past week, and that he had secured indications that the stability of the sub could be improved by the addition of the proper salt.

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Status of Sub Conference Matters - August 31, 1937

Brittleness on Nitrate Cine Positive

During the past several weeks somewhat more than the usual amount of brittleness has been noted on Nitrate Cine, this being chiefly caused by N510 coatings. A tabulation of the percentage found is as follows:

June 30	13%	July 27	26%	Aug. 17	13%
June 13	21%	Aug. 3	26%	Aug. 24	12%
July 20	21%	Aug. 10	13%	Aug. 31	12%

In connection with the above, some experimental skins were delivered by Mr. Carroll, and in the case of N510 Cine we note a decided tendency for change in attack power with a change in percentage of water in the solvent combination as follows:

	N510	Camphor #3	Butyl Alcohol #63	H_2O	Ratio	Attack Power
XXXI-120-A	100%	10%	40%	0%	4-1	90
B	"	"	"	1%	"	94
C	"	"	"	2%	"	96
D	"	"	"	3%	"	92
E	"	"	"	4%	"	97
F	"	"	"	6%	"	101

In another series of skins in which PR cotton was taken as a standard and this mixed with small amounts of N510, DD Gray scrap, and acetate cotton, practically no difference in attack power was noted. This data is as follows:

	N510	PR	Acetate	DDGray	#3	#63	Ratio	Attack Power
XXXI-120-G	10%	90%			10%	40%	4-1	81
H		95%	5%		"	"	"	87
I		90%	10%		"	"	"	86
J		100%			"	"	"	85
K		80%		20%	"	"	"	83

The recent improvement in brittleness has been accomplished by judicious addition of water to the gel subs which has the effect of weakening the sub very slightly.

DS Gel on Class #9

An approval has recently been signed giving us permission to use DS gel in the sub for all class #9 Cine Nitrate. We, are, therefore, beginning to put the above change into operation on #211 machine.

DS Gel on News Support

Approval has been started to increase the use of DS Gel on our News machines by adding it at the rate of one machine per month.

A Common Sub for Film Pack and NC.

For some time we have been running one machine on Film Pack using a new sub made up with our chemical #5 (melonic acid), and 60% of the regular amount of stock solution. Stripping results on regular coatings continued to be good over several coatings, and on June 21, an approval card was started to put a second machine on this type of subbing with the idea that this sub could be used for common sub on NC and Film Pack products. However, Mr. Seel felt that we should not move on the second machine for the time being until more experience had been gained on results secured with the first machine. Two months have now elapsed since that time and additional coatings have been made as follows:

			Stripping from Base
July 22,	1013-143	Panatomic NC	11 rolls solid OK
July 30,	144	" "	5 " " "
Aug. 5,	145	" "	12 " " "
" 5,	1015-173	S.S. Pan. "	4 " " "
" 5,	174	" "	2 " " "
" 15,	175	" "	17 " " "
" 19,	176	" "	15 " " "
July 22,	2027-5	Pan.Press FP	8 " " "
Aug. 20,	6	" "	4 " " "

In addition to the above it had been reported from Mr. Paddock's office that 98 to 99% of the material produced from #28 machine during the past two months have been OK for Pan coatings. This means blisters, and other defects have been virtually eliminated. It is interesting to note that the first approval sheet was obtained on performance based on #27 machine. In the meantime it was convenient to manufacture Film Pack on #28 machine during the last three months and we therefore have a successful performance period for this sub change on two machines instead of one over a considerable period of time.

Mr. Klem has subjected some of the above type coatings to Tropical Incubation. Results are as follows:

A -	2 Weeks Tropical (Heater at 73°)		2 Months Tropical (Heater at 130° Over)		
	Wet	H. After	Dry	Wet	H. After
1015-156-1 Exp.	Gel-OK Em.-OK	OK OK	OK OK	OK SL.Sl.offUct.	OK
1015-156-2 Chk.	"	"	"	"	"
1015-156-3 Exp.	"	"	"	"	"

B- Another test was exposed to various high temperatures of processing, results being as follows: (Two months tests)

Set #1 - Developed at two minutes at 85F.

	Fix 1 min.	Fix 12 min.	Wash 20 min.	Em.Dry	Gel.Dry
1015-156-1EX.	Hard	OK	OK	OK	OK
1015-156-2Ch.	"	"	"	"	"
1015-156-3Ex.	"	"	"	"	"

Set #2 - Developed one minute 15 seconds at 90F.

	Fix 1 min.	Fix 12 min.	Wash 20 min.	Em.Dry	Gel.Dry
1015-156-1EX	Vsl. Soft	OK	OK	Vsl.Retic.	OK
1015-156-2Ch.	Hard	"	Vsl soft	"	"
1015-156-3Ex.	"	"	OK	"	"

It would therefore appear that the 80% stock in all tests that we have run to date over a period of some six months and over has not shown inferior to the standard 80% stock, and we should be justified in putting on a second machine, the product from this machine to be used for either NC or Film Pack product as required by building #29.

The Use of High Nitrogen Cotton - Low Alcohol Solubility for Subbing.

X1498 Ucoat has been made up and applied on #56 machine from Aigust 11, to present date. This Ucoat features the use of 11.5% nitrogen in the nitrate, whereas the average nitrogen of our regular Ucoat run 11%. Also the new cotton has 20% ethyl alcohol solubility as compared with 75 to 95% with regular cotton. A comparison of stripping and brittleness on 21 ft. tests has been made between #47, 50, and 56 machines, 47 and 50 machines using a regular cotton in the Ucoat and 56 machine using experimental cotton. Results are as follows:

		Average Stripping	Average Brittleness
#47 machine	17 ft. test.	94% OK	24 10 18 8
50 machine	14 " "	79% "	26 13 16 19
56 machine	13 " "	100% "	32 12 23 17

It can therefore be seen that the new cottong is apparently an improvement from the standpoint of stripping and brittleness. This cotton is also more soluble in the sub solvents and results inn a better coating.

Translite

Recently an approval was started to use Kodalith base for Translite coatings. The main argument being that the brittleness as determined by Dr. Carver's pin machine shows the same for Translite emulsion on Translite base as on Translite emulsion on Kodalith base. It subsequently developed, however, that these brittleness results were taken in each case on undeveloped samples. When brittleness results were later checked on processed

[illegible] should therefore be determined whether good brittleness results are essential on processed Translite before this approval goes thru.

L.S. Portrait

Long time keeping tests have recently been reported which feature the use of DS Gel and Chemical No. [illegible] in the sub. This combination was started at the time when objectionable surface lines, etc. were being noted in the LS product which made a great part of this product of inferior grade and not OK for Pan coatings. As a result of 40 ft. tests, the experiment as well as two checks show equally good for stripping, brittleness, dye retention, buckle, and curl. In the case of one check very slight to slight surface lines were reported, the other check and the experiment being OK for lines. We are listing below the results of long time keeping on experiment and checks.

Emulsion 19985 - Check #1

Keeping Period	Testing Date	DK-50 5 Min. Results Clear Speed	Gamma	Fog	Blue	Green	Red
Routine	5-12-37	600	.95	.07	160	110	81
5 wks.	6-13-37	580	.95	.05	150	100	81
3 mo.	8-12-37	490	.90	.05	130	95	71
6 mo.							
9 mo.							
3 day inc.	5-21-37	580	.93	.08	150	110	85
6 day inc.	5-21-37	500	.92	.09	130	100	74
3 mo. S.R.	8-14-37	420	.80	.10	120	81	76

Emulsion 19986 - Check #2

Routine	5-12-37	560	.97	.07	160	100	81
5 wks.	6-14-37	580	.99	.05	160	100	83
3 mo.	8-12-37	510	.91	.05	140	100	74
6 mo.							
9 mo.							
3 day inc.	7-21-37	490	.91	.09	140	100	81
6 day inc.	5-21-37	490	.90	.10	140	100	81
3 mo. S. R.	8-14-37	360	.84	.10	87	69	49

Emulsion 19987 - Expt.

Routine	5-12-37	580	.95	.06	170	110	85
6 wks.	6-14-37	550	.95	.05	150	110	79
3 mo.	8-12-37	500	.91	.06	130	87	70
6 mo.							
9 mo.							
3 day inc.	5-21-37	480	.89	.09	130	89	68
6 day inc.	5-21-37	470	.90	.09	130	89	69
3 mo. S. R.	8-14-37	360	.82	.09	100	65	42

S. R. is summer room.

Mr. Russell stated ther are no differences in keeping for these emulsions which can be considered as real or significant. We are therefore in a position to coat two full rolls of this product in order to study the improvement in lines over a longer running time.

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Sub Conference for September 10, 1937

Approval for DS Gel

It was noted that approval sheets had been received during the past week, giving permission to use DB Gel in the sub on all class #9 Cine Positive and News Machines.

Brittleness, Tackiness, and Comblines on Nitrate Positive

Mr. Babcock noted that the brittleness on Nitrate Cine Positive has been brought down from 26% to 7%.

It was noted that some tackiness trouble was being observed on News support in building #53, making it difficult to produce unknurled rolls for Foreign shipment. In general, we have been able to control tackiness by weakening the sub, this with particular reference to machines in building #20. However, in machines at building #53 this method has not been as successful, due to the fact that we run into comblines and bloom particularly when the sub is weakened, thus making the tackiness control more difficult. Mr. Babcock suggested that this condition could be somewhat improved by using 80% gel stock in the sub. However, Mr. Seel preferred to find some other way out, if possible, and suggested that we might try a jacket hopper, thus cooling down the sub or throw cool air on the support before it was subbed. Mr. Babcock suggested that the support should be cooled before it got to the windup to improve this trouble. It was eventually decided to refer this problem to Dr. Carver who should investigate tackiness to determine the cause of same.

Mr. Seel also suggested that the method of taking attack power tests should be referred to Dr. Carver to see whether a better technique could be debeloped for producing more reliable results.

Filtration

Mr. Seel spoke about the excellent filtration properties of the Seitz Filter Paper recently demohstrated by Mr. Tucker. This paper however costs 35¢ a sheet, whereas the Dyckman paper, which produces practically the same degree of filtration, could be secured for a fraction of the above cost. It was decided to secure some of the Dyckman paper and test it out in the filtration of our subs. Mr. Seel stated the Dyckman paper would give a better filtration than the Karl Kieffer paper pulp method.

Mr. Babcock stated that the centrifuge was scheduled to be completed next week. This operation will undoubtedly effect a decided improvement in the filtration of the Csub and Ucoat.

Safety X-ray

X-ray stripping results have been a lot better during the last week or ten days. Brittleness stays about the same (10 to 20%). Mr. Seel stated that it would be interesting to secure the average brittleness results for the winter months of 1936 and 1937, and also figure out the average results being secured at the present time, to see just where we stood on the brittleness question.

Last week there was some trouble from slugs and bubbles, resulting in a slight liney condition in the X-ray subbing, and Dr. Eilers asked to have the percent solids cut down from 3-1/4% to 3%. Mr. Seel wished to find some other way of effecting improvement stating that it should be actually determined whether it was bubbles or slugs causing the lines. Mr. Babcock suggested that the immersion pans with glass sides could be used to advantage. Mr. Seel observed that we have had considerable stripping on the Safety X-ray during the last two months.

Mr. Babcock stated that the new type F cotton featuring high nitrogen content of 11-1/2% and low alcohol solubility of 20% should be an improvement as far as slugs were concerned, and arrangements were underway to secure more of this cotton for use on machines. Mr. Seel stated, however, the old type cotton should be kept on hand for some time until we learn more about the new type cotton. Mr. Babcock stated there were approximately 20,000 lbs. of standard F cotton on hand at the present time and that the stock was being kept up.

Mr. Seel inquired about gelatin stocks, and Mr. Babcock replied that we have stocks on hand for six months ahead. It was noted that we have to predict the amount of regular and DS type gels, that are going to be needed, in advance, and it was estimated that 3/4 of our present consumption is DS type. Mr. Seel stated that we should keep enough supply of regular gel on hand to protect ourselves should we run into trouble with DS type. As an example, Mr. Seel mentioned the fog trouble we were having on X-ray at the present time, stating that it might originate from an inferior type gel.

Mr. Babcock mentioned that we went back to the use of regular gel on the safety X-ray machines last summer when we got into static trouble. At that time two machines had to be changed over. Mr. Wells stated that we might try 5 rolls at the present time, using DS gel to see if static conditions were satisfactory.

London X-ray

Mr. VanDerhoef asked about the stripping on London X-ray, and it was reported that whereas previously considerable stripping trouble had been noted, recently the stripping had been coming OK. It should be noted in this connection that the M1-2000 Portrait machines coating over the same period showed satisfactory stripping results, which opens up the question as to whether when we are near stripping troubles, the omission of the C sub is a good thing. London X-ray sub is identical with Portrait except that the C sub application is omitted.

Common Sub for NC and Film Pack

Mr. Babcock stated that one machine using 60% regular amount of stock in the sub with chemical #5 was being used at the present time for Film Pack production, and stated that approval was on the way thru to put on another machine, the second machine to be used for NC or Film Pack as needed. Justification for this move was sought by reason of the fact that for the last two months, #28 machinex has been delivering product with 60% stock in the sub, and over 98% of the delivering product with 60% stock has been pronounced OK for Pan by Mr. Paddock, being entirely free of blisters. Stripping from the base has been solid OK on rolls coated. Also additional Tropical Incubation tests have been run for stripping as suggested by Dr. Nadeau, and after two months keeping, the stripping of the 60% material was shown to be equal to the check. Mr. Seel, however, felt that it would be well to hold up on this move until next spring.

High Nitrogen - Low Alcohol Soluble F Cotton

As noted in a previous paragraph, this type of cotton appears to have advantages over our present F cotton as far as X-ray production is concerned, 56 machinex having shown over a period of several weeks an improvement in the appearance, as well as stripping results. Brittleness results were about the same. Extended tests have not been run, however, as yet with C sub on Cine Kodak and Kodachrome products.

Translite

Recently an approval sheet was started to use Kodalith base for Translite coatings, based on a set of brittleness results which indicated that Kodalith base gave no more brittleness than Translite with Translite emulsion. It was discovered that this brittleness referred to the unprocessed film, and that after processing the brittleness of the Translite emulsion and Translite base was much superior. Recently two full rolls of Kodalith base and one roll of Translite base were used in a regular coating, and pieces of these films were also tested for brittleness, and it was found that the same conditions remained; viz., that the Translite base showed very good brittleness results on the processed sample, whereas the Kodalith was "zero" for brittleness. It is recommended that if flexibility of Translite film after processing is required, that we continue to supply the same Translite base instead of changing to Kodalith.

LS

In order to improve the appearance of LS Portrait, M-1-2000, an experiment was run using chemical #5 and DS gel. Results have been reported in Sub Conference Report of August 31, in which results of 3 months keeping showed the experiment to be equal to the check. It was decided to coat two rolls of this product to observe whether the support is better for lines over a more extended run.

DS Gel on Tech. Port.

Stripping, curl, and dye retention results are OK when DS Gel is substituted for regular gel in the sub on Tech. Port. Sensitometric results have not as yet been heard from.

Sub Pump

Mr. Babcock stated that the Hickman type sub pump had been moved to 22 machine for a trial, and it would shortly be put into operation experimentally.

#23 Machine

Mr. VanDerhoef called attention to the new donstruction on #23 machine, which involved floating the support over the machine, and suggested that sub experiments with this type of processing should be tried using Cine Support.

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Average Brittleness Results on Safety X-Ray

From 1934 to Present Date

Building #14 - Dry Room Brittleness Results

e	Class	Av.RH	Tests	Av.Britt.%OK	Total Britt.	Av. No. #Tests	%	
. 1934 to il 1935	9	11.7%	87	22 23 28 29	102	41	.32%	Hot wash
. 1935 to . 1936	Blue AA	11.9%	411	24 28 21 23	96	40	.01%	
. 1936 to il 1936	9	13.3%	538	25 15 17 9	66	126	.25%	Hot wash

Building #7 - Conditioning Cabinet Brittleness Results

h 1936 to 1936	20	14.0%	389	21 6 14 3	44	80	.22%	Hot wash
1936 to 1936	23	14.0%	63	22 7 15 5	49	8	.22%	Hot wash
1936	24	14.0%	10	19 10 13 3	45	2	.24%	Cold wash
1936 to 1936	21	14.0%	513	22 11 15 5	53	104	.18%	Cold wash
ch.1936 to ch 1937	25	14.0%	214	14 5 10 2	31	117	.18%	Cold wash
ch 1937 to y 1937	25	14.0%	473	16 5 11 2	34	197	.17%	Cold wash
y 1937 to t. 1937	21	14.0%	323	27 14 18 8	67	76	.16%	Cold wash

Hot wash refers to the fact that the F cotton was washed with hot water.
Cold wash " " " " " " " " " " " cold water,
after nitration.

C O

Sub Conference of September 17, 1937

Filtration of Subs

Some experiments in filtration were run by Mr. Babcock, and samples of C sub were exhibited. The various types of filter paper used were timed for speed of filtration and the resultant filtrates were examined by Mr. Tucker by a parallel beam lamp for clarity. The results were as follows:

Kind of Paper	Time in Seconds	Clarity
Seitz	64 seconds	Best
Alpha	96 "	Second Best
Sperry 753-50	89 "	Third "
Eatan & Dyckman	31 "	Fourth "
Check - Kimpak	-	Worst

Some discussion ensued on the degree of filtration. Dr. Carver thought that possibly if the very fine particles were not filtered out, filtration would be good enough. It was also argued that the finer particles should be filtered out to make maximum clarity. It was pointed out that this might cause a tacky condition from the standpoint of optical contact.

In connection with the filtration of gel subs, Dr. Carver stated that Grenfell cloth was better for filtration than canvas, and that it it was agreed to obtain some of this cloth from Mr. Beach to try an experiment.

Mr. Couch stated that there was a great deal of haze in Stripping Film dopes made by Mr. Lamb, and that a more efficient filtration on this material should make an improved Stripping Film.

Tackiness and Bloom

Mr. Wells stated that tacky condition on N510 base appeared to be due to the deposit of gel on the surface. Mr. Babcock stated that when the sub was weakened with water we got away from tackiness, which practice will get us into bloom trouble if carried far enough. The support will show bloom but not be tacky, and Mr. Seel felt this might be due to smothering of the gel layer by cotton. It was agreed that a bloom was a result of cotton precipitation and Mr. Seel thought that this possibly might occur on the surface of the base. It was pointed out that the use of DS gel was helping this bloom condition to some extent. This points to the presence of ash in gelatin as being a partial source of the bloom.

Mr. Seel wondered what would happen if a straight water solution of gelatin was applied at the base of the wheel on N510, also syating that a spreading agent might be included to prevent repellency.

C O

The Speed of Coating

Mr. Seel spoke about the use of soap on the wheel surface to increase the stripping range of support, and consequently speed up production. Mr. Wells stated that soap should be included in the dope for an experiment, on the Carver machine. It was noted that a preliminary experiment could be run by small plate coatings, coating half the plate with the check and the other half with the experiment. Dr. Carver stated that he would investigate some of these things with particular reference to speed up Aero coatings.

Liney Condition of X-ray

In connection with a slight longitudinal liney condition that appeared on the Safety X-ray last week, Mr, Wells thought that the cotton should be filtered better.

It was noted that formerly U-coat cotton blends were tested by running a 25 ft. piece examining same for haze and stripping, and that now the tests have been changed and two full rolls will be run taking sample from the finish of the second roll and checking for lines as well as haze and stripping.

Mr. Babcock noted that at about the same time we got into the liney trouble, we started to use F-280-A cotton which according to Mr. Sillick was the first F cotton to be centrifuged in the warm humid weather, which is opening up the possibility of greater hydrolysis and consequent haze. In order to off set this, the makeup temperature in building #45 has been increased from 90 to 100F, and the F-280-A cotton has been removed from the blend and replaced with a more recent cotton.

Mr. Seel suggested titrating cotton solution with a suitable non-solvent under standard conditions. He also stated that it might be possible to use anhydrous ethyl alcohol to improve lines.

In connection with the high nitrogen type cotton, Mr. Babcock stated that Mr. Folwell was engaged in the manufacture of 4,000 lbs. of this material to be used on the X-ray machines as a step in production of a more soluble cotton U-coat. On some 30 or 40 rolls made on #56 machine, where this cotton was used, appearance and stripping results were better than on the other machines, and brittleness was comparable at 14% R.H. Mr. Seel wished to have the brittleness checked at 10% R.H. before running the new cotton on all machines.

Kodachrome Subbing

Dr. Nadeau stated that he had recently been able to dissolve small amounts of gelva resin in nitrate U-coat, and he exhibited some samples of recent machine coating in which a small amount of gelva had been incorporated in F cotton U-coat, and application made in the air section by immersion, and this followed by a gel sub on the dryer. Such a method, he explained, gave OK dye retention, stripping, and skidding results, and the resultant product was no worse than slightly brittle. He stated that further experiments would be run during the week.

Glue for Stripping Film

Mr. Babcock stated that it would be disirable to set up specifications for Stripping Film glue, so a production for this material could be arranged. Mr. Couch stated that he would be using about 2,000 lbs. per year of the type of F-76, F-70, and F-71. F-62 and F-65 are slightly different in that they are made with different stock. It was agreed to determine specifications for this glue as soon as possible, so that a production schedule could be set up.

News - PR116

An approval sheet requesting permission to use ~~a~~ 80% regular amount of stock in the sub make-up for News support was returned by Mr. Seel with the suggestion that it be held up pending the out-come of Dr. Carver's tests for tackiness.

GSB:S

G.S.Babcock

Sub Conference of September 24, 1937

Safety X-ray

Inspection of the X-ray machines during the past week showed some inconsistency in the setting of the pans which might result in immersion cups being jammed up against the base, which would cause the acetate base to be sheared off by the cup edges, this material then dropping down into the pan and contributing toward a liney condition. In order to check this situation, the springs will be tested to see if they have lost elasticity.

Mr. Babcock reported that he had checked the brittleness on Safety X-ray made on #56 machine and using the new high nitrogen type cotton against the regular F cotton used on other machines. Results at 10% R.H. for 36 hrs. processing were zero throughout. These tests were run at Mr. Seel's request. Samples were exhibited which indicate that the appearance of the base coated on #56 machine was slightly better than on other machines.

It was agreed that something should be done to improve the brittleness of Safety X-ray, and Dr. Nadeau replied that some of the Cine subbing methods that have been investigated should be allright for X-ray, and that these methods could later be used on M1-2000.

DS Gel for Safety X-ray

Mr. Babcock stated that five rolls of Safety X-ray had been made where DS Gel had been used in the sub, and that Mr. Klem had been notified of these rolls and would follow thru the coating from the standpoint of static.

New Type F Cotton

Mr. Folwell is making up a 4,000 lb. batch of high nitrogen low alcohol soluble cotton which should be ready in about a week or 10 days;

16mm. B&W Safety

Mr. Wells stated that Mr. Sulzer has OKed the coating of 16mm. B&W safety on M3-2501 base. The amount to be made will vary anywhere from 20,000 to 60,000 ft. per week and will mean half a machine per year. This does not refer to Kodachrome, Recordak, Cine Kodak, etc. Dr. Gould stated that HI sub was used in the last coating, and stripping results were satisfactory, product being slightly brittle. It was agreed to have someone come in and run special tests on this product Sunday morning. Dr. Nadeau stated that HI and I subs would be OK for stripping.

LS Portrait

During the past week some trouble on dry stripping has been noticed on the class #3 type LS Portrait which involves the use of Ucoat without Csub. One case of wet stripping was noted. At Mr. Seel's suggestion this machine has been turned over to class #2 type where the C sub is used, and experiments are being run on class #3 where different strength gel subs are used in one case and in another case the solids in the Ucoat are raised from 3% to 4-1/2%. Dr. Gould observed that stripping is OK on class #3 for 20 or 30 rolls, up to the time of the recent shutdown, after which the stripping started. Dr. Nadeau stated that we had a similar condition of stripping a year ago which was remedied by heating up the air section in which the gel sub was applied from 110 to 130F. Dr. Gould agreed to look into the conditions of gel sub application to see if any differences could be picked up.

Samples submitted by Mr. Babcock indicate slightly more haze on class #2 where the C sub was used, however this condition was not very pronounced.

Mr. Babcock stated that two rolls of LS Portrait had been coated where chemical #5 (malonic acid) was used in the sub instead of Chemical #1 (salicylic acid), the purpose being to improve surface appearance of this product. Tests have been received, and the emulsion keeping has been satisfactory on long time tests. Samples of base were very good for appearance on these two rolls, and it was agreed to have them coated and tested before releasing to the trade.

Translite

Mr. Wells stated that Mr. Seel had ruled that we should continue Translite coatings using Translite base, and talk to Mr. Gunderson to see what our present needs are on Translite to assure sufficient stock ahead. Mr. Babcock stated that building #29 had coated two more Kodalith rolls to Translite emulsion, and both rolls were showing zero brittleness xthruout. It was agreed that this method is producing a base with more brittleness particularly after processing, and no time should be lost in getting back to the Translite base.

Kodachrome

Mr. Babcock reported that in order to improve the stripping of the Kodachrome a change had been made in the gel acetate sub where the percent gel was increased from 1.5 to 1.7, the acetate content remaining the same. It was originally felt that this change had made some slight improvement in the dry stripping, but after further tests had come thru, it was apparent that very slight improvement, if any, was noted. In the meantime the final coatings have come thru where old and new amount of gel was used, and both types show "peels hard" dry.

Dr. Nadeau stated that he had some experiments under wasy, and was ready to run two rolls involving first the application of a gel acetate sub, and secondly a gel acetate sub containing 90% gelatin and 10% cotton. He stated that stripping results were all solid OK on tests. He also stated that another experiment was being run which involved the use of an F cotton C sub to which a small amoung of gelva was added, this resulting in improved dye retention. Inasmuch as this type of subbing is usually OK for stripping, the hope was expressed

that this would be a possible method of improving stripping on regular production.

Cine Positive Nitrate

Mr. Babcock reported that brittleness on Cine Positive Nitrate was down to 1-1½% during the preceding week.

In connection with the recent complaint from the trade on 6-1/2" wet stripping repeats, which were thought to be due to oil originating from 2" rolls on #222 machine, Mr. Babcock reported that 10 rolls of base included in the same series had not yet been coated to emulsion and were being held pending disposition. It was agreed to have Mr. Rupert test these rolls before allowing them to be shipped.

Cine Negative - DS gel

Mr. Babcock reported that three months keeping tests had come thru on Cine Negative tests where DS Gel was used in the sub, and OK results were reported by the Research Laboratory. It was still felt that future production of this material should be temporarily held until production of Cine Negative was on a better basis.

Ucoat Heater

Mr. Babcock stated that he had an SER (Service Engineering Requisition) for the installation of another nickel heater to regulate the temperature of the X-ray Ucoat. The heater already installed is controlling the temperature of the Portrait Ucoat very satisfactorily. It was felt if the Ucoat temperature of the X-ray was controlled that greater freedom from lines on this product would be noted, particularly during the winter months when ther is more tendency for the Ucoat to reach a cooler temperature.

Grenfell Filter Cloth

Mr. Babcock stated that he had asked Mr. Beach for some of this material for filtering. Mr. Beach agreed to deliver some to us as soon as their shipment arrived, which should be in about a week or 10 days.

Stripping Film Glue

Specifications for Stripping Film glue were discussed, and it was noted that whereas F-76 type was standard, that recent experiment using F-62 had given more satisfactory results. Likewise, Mr. Bruce is making up another batch of F-79 which is supposed to duplicate F-76. It was agreed to hold up any future production of Stripping Film glue until it had been decided just what type was to be used.

C O

Tackiness of N510 Nitrate Cine

Dr. Robinson, from Carver's Department, gave a preliminary report on his investigations as to the cause of tackiness. From preliminary observations, he concluded that the support seemed to be tacky if the gel sub was applied near the windup. He reported that WAL dope, a s formerly used in the Roll Coating, also gave trouble from tackiness, this being a soft dope, and that tackiness was improved if a harder cotton was added to the mixers. In this case it might seem that the support was extremely soft, and approaching a tacky condition.

Mr. Babcock pointed out that we never have much tackiness with hard PR, and that RP500 runs into trouble. Mr. Wells stated that WAL type was never cured as much, shrinkage being 1-1/2%.

It was pointed out if the knurls are used, the surfaces do not come into close contact, and tacky condition does not show up.

Dr. Robinson pointed out there were two comparable machines; viz, #27 and 220, both machines deliver the same kind of support. #27 has not been tacky for some time, whereas #220 has been giving a lot of trouble. The most striking thing between the two is that the temperature of the windup section on #27 machine is 99F, whereas #220 is 112 to 114F.

It was noted that in building #53 we are using center feed inlet and outlet type of sub application, whereas in building #20 the plain hopper is used, the sub being fed in the middle and outlet being at both ends. Dr. Robinson stated that he plans to sun some experiments introducing some dye into the sub hopper to observe distribution. He had samples of support wound up in a roll approximately 10 ft. long of which one end was noticeably tacky when pressed with the fingers, the other end being quite flexible, the layers appearing to slip on each other without much trouble. In a series of dye tests where a water soluble dye was selected to dye the gelatin layer alone, it was noted by independent observers that the greatest depth of color occurred on the tacky end of the roll. This indicates that the heavier the gel layer the greater the tackiness. In connection with the above, it was noted that the amount of stock in the sub on N510 machines had been cut down to 80%, and that tackiness and other considerations were much better. This method had been suggested as a remedy for PR116 News but has not as yet been allowed.

Mr. Couch observed that in the subbing of Eastman Direct Positive paper with gel sub, that where the sub is stale, the color is lighter after a sub has been dyed. The inference here was, as the sub gets stale, the solvent evaporates out and does not sufficiently attack the base.

Sub Conference of October 1, 1937

XRay

Dr. Gould wondered if we should not eliminate the machine tests on F. Cotton blends for haze, Mr. Wells pointed out whereas the small samples did not apparently pick up the trouble, that by running 2 full folls we might be able to improve this test and that it should be given a fair trial. Dr. Nadeau stated that the testing might be eliminated when we got to the new type F cotton. In a general discussion it was agreed that if Dr. Nadeau could work out a laboratory test to show the effect of different F cotton blends, that some wast could be saved on the regular machine coating.

Mr. Babcock noted that the Ucoat heater installed in the hallway was serving the LS machines, and that with minor changes in piping, it could be made to serve the XRay machines instead of the DS. It was agreed that this should be done, inasmuch as major troubles were being felt in the XRay machines at the north end, and also the LS machines would have the benefit of more heating effect in the Ucoat in its long travel down the hallway from the north to the south end. In the meantime a new heater is to be constructed and installed so that both products may have the advantages of this regulation.

Dr. Gould stated that he believes the temperature of the Ucoat in the circulating system on the machines might have something to do with the production of lines. He cited on instance in which the Ucoat on #49 machine testes 11 degrees lower than that on 56 machine, at this time we were having trouble on #49 machine, [redacted]
It was pointed out that the sub pans had recently been changed on #49 m machine, which doubtless was one reason why the Ucoat temperature was lower than on #56 since the system has just recently been filled up.

Mr. Seel stated that there had recently been quite a number of condemnation sheets on Safety Xray because of stripping trouble. However, Dr. Eilers stated that no rolls had been thrown out in quite awhile and he agreed to look up this report. Dr. Carver spoke about some wet stripping tests that he had been taking with building #29. He stated that 46-7273 was OK for stripping, whereas 47-4119 was NG. These rolls had been emulsion coated and dried down under various wet bulb temperatures. Preliminary indications are that samples dried at lower temperatures give superior results on stripping. Dr. Carver stated that rolls showing NG for wet stripping was very bad under one condition of drying, but by changing the wet bubb temperature the stripping seemed to be passable. It was agreed that this was very interesting work and should be continued. Mr. Wells suggested running brittleness tests at the same time.

Mr. Seel inquired how the brittleness was coming on XRay and Mr. Babcock stated that current results of 10 to 20% were being received when tested at 14% R.H. When these samples are tested at 10% R.H. results are zero, as were also samples of XRay made with the new type F cotton Ucoat on #56 machine. In general, current brittleness results on an average are comparable with those being secured at this time last year. However, results are not as good as three years ago when class #9 was being coated.

Aero

Mr. Babcock reported that 2 rolls of Aero had been retested, which were waterboxed, and after 25 ft. had been removed, stripping results were OK. Another set of retests is going thru where 20, 15, and 10 ft. were removed from the ends before testing. This is an indication that the ends of the rolls are loose during reprocessing, and this feature is to be watched more closely.

New Centrifuge

Mr. Babcock stated that the first run had been made on the new centrifuge during the past week, and samples were exhibited which indicate that the quality of the material filtered thru the centrifuge was slightly better than that filtered thru the clam shell filter. The present rate of speed is 1,000 lbs. per hour. This is not sufficient to give us production comparable to the clam shell, and efforts will be made during the coming week to speed up this production without interfering with quality. The residue from the centrifuge was very small in amount, and the loss in total solods was estimated to be less than 1% of the amount started with.

Kodachrome

The matter of Kodachrome stripping was brought up again, and it was noted that the stripping trouble as reported by Mr. Scott occurs between the sub and the emulsion.

Dr. Nadeau stated that his tests on experimental rolls were being slit, and that on Monday morning he would have quality tests.

LS

Last week it was reported that class #3 LS was showing some stripping trouble. During the past week stripping tests have been run with various strength gel subs, and it was found there was some improvement in the stripping when the sub was strengthened. Also a few rolls have geen run where 3-1/2% solids were used in the Ucoat instead of 3%, and results on stripping will be available next week.

Cine Safety- M3-2501

Dr. Gould reported that last week it was decided to use HI in the first run of this product, but on Sunday stripping was reported and an F-150 sub was used. This change takes care of the stripping, but brittleness is obviously worse.

GSB:S G.S.Babcock

Tackiness

Dr. Robinson was present and gave results of his work during the past week on the problem on tackiness. Last week mention was made of the effect on tackiness by the addition of scrap, and Dr. Carver stated that it was his opinion as scrap was increased, tackiness was diminished. It was stated that Mr. Young felt that when the scrap was recently increased from 45 to 55%, tackiness was improved. Dr. Robinson stated that during the investigation of bubbles in nitrate dope, Mr. Folwell had pointed out that when the scrap is recovered, 200% of its weight of water is evaporated on it. However, when the cotton is made only 6% weight of water is evaporated. This then would indicate that a much larger amount of water would be evaporated on the scrap, when scrap content of dope was 55% than if it were 45%. This would result in the distribution of a much larger amount of residual material from the water evaporated, and it is possible thay this may have a bearing on the tackiness problem.

Experience has shown that tackiness is improved by color or imbibition treatments. Also, tackiness is more pronounced on the wide machines than on the narrow machines. Dr. Robinson stated that by increasing the thickness of the knurl on one side, the ease of winding could be aided. Also it seems consistant that east side is always the side that requires building up to facilitate this operation. In other words, this is an indication that the east side is the more tacky side. and this fits in with the picture previously presented as a result of dye dip tests, and analysisl It was mentioned previously that the use of a chilled roll near the windup might be an improvement on this tackiness problem. This is further strengthened by the fact that Mr. Ward has stated that a chilled roll helps in the handling of Film Pack paper when coming from the calendars.

Dr. Robinson stated that in order to facilitate the cleaning of the sub hopper a small piece had been cut out of the end of the dam to permit water to drain thru this hole after the hopper had been cleaned. He pointed out that this cut piece was somewhat larger than it should be to require even distribution of the sub, inasmuch as under present conditions the sub would run thru the piece cut out one end of the hopper in preference to being evenly distributed across the entire length. The effect of this in the coating machine is that the sub enters the west end of the hopper, and leaves at the west side. Only about 10% of the sub goes out of the east side. This would result in a stagnant condition of the sub at the east end of the hopper. It will be recalled that the east end of the hopper is also the tacky sode of the support. This result would be much less serious if the hopper was so constructed if the level of the sub was raised to a point slightly above the level of the dam, and it is planned to have one hopper equipped with a stand pipe or other arrangement s so that this result may be accomplished.

The following analysis of sub solutions were submitted, samples being taken from #220 machine.

C O

		Solids	Acid	#7	Water
Average Drawoff		6.19 gr/l	64.2	34.1	8.5
Fresh Sub		4.98	59.2	37.1	7.4
#1	west side	5.53	60.3	35.7	7.6
	east side	7.94	65.2	30.3	9.0
			6		
#2	west side	5.62	65.8	35.7	7.9
	east side	8.71	61.0	28.7	9.5

Dr. Carver pointed out even if the trouble in winding up tacky rolls was largely eliminated by mechanical means, that the primary subject of tackiness is still with us and will haveto be solved some time or other.

Sub Conference of October 8, 1937

Stripping Experiments on Emulsion Coatings

Dr. Carver, Mr. Wynd, and Dr. Hale explained some experiments that are being conducted to determine the causes of stripping. This work was being carried on in collaboration with Dr. Carlton of building #29.

Dr. Carver explained that Dr. Hale had been able to produce a change in stripping from OK to Strip easy by merely varying the temperature of the wet bulb during the drying down of the emulsion. The wet stripping is worst at high wet bulb temperatures and best at low temperatures. Dr. Hale pointed out that under different conditions of drying there was a difference in the swell of the emulsion and he stated that he was trying to tie up this factor with stripping results.

The method employed in making these tests involved coating the emulsion at building #29 at standard speeds and other conditions, after which samples were cut out and deposited in containers, transferred to the laboratory and dried under different conditions.

Dr. Carlton stated that Mr. Rupert gave a list of rolls that showed OK on daily test but which showed questionable results when coated to emulsion after having been coated in 18 room. Inasmuch as #9 is coating with a lower wet bulb temperature than 18 room, this would seem to tie up experimental results noted above. Dr. Carlton stated there was a higher percent of wer stripping in general in 18 room than in #9. Mr. Seel stated that some time ato there was very little difference between the two rooms, and Dr. Carlton replied that they had definitely raised their dry bulb temperatures because of the emulsion requirements.

Mr. Seel inquired whether any relationship of brittleness had been discovered with the various drying conditions, and Dr. Nadeau stated in the 10% R.H. room the brittleness were all generally bad and very little correlation was shown. Dr. Nadeau recalled that some time before we went to the Blue AA type of sub that it was possible to sub and get dry stripping about Peels Hard, without getting into wet stripping troubles. This type of subbing gave us very good brittleness results. He stated that further developments in the experiments might make it possible for us to get back to these conditions. Mr. Seel expressed the hope that something might come from the experimental results to help the brittleness on Portrait film, as well as in the subbing of M3-2501 Cine Positive.

Dr. Nadeau pointed out that another place where results would be important are various gel backings as wet stripping was always a problem. Dr. Carlton stated that on Portrait involving a gel coat one side and emulsion coat on the other side, the coating was dried high on one side and low on the other. It was stated that this appeared to be an important ppint in connection with curl, inasmuch as there is a relation between the rate of drying and swelling of gel.

Kodalith stripping, the amulsion of which is easily dried, was then noted. Mr. Wynd stated by this laboratory test it might be possible to predict the conditions of drying that would be most advantageous in a regular emulsion coating, which from a production standpoint would be of great value. Mr. Wund's proposal was to dry down samples of the tests, cutting out some after they had been emulsion coated and chilled. The drying down data when obtained would then be a guide for the regular coating.

Mr. Wynd stated that they were preparing to do some work on chilling in relation to stripping. Mr. Babcock noted that in the past some emulsions after being applied to the base had run as much as two feet before it was actually set, and stated that this might possible result in a washing away of gel in the sub layer thereby causing st ripping.

Mr. Seel noted that in waterboxing, however, where presumably much gel was removed from the sub layer, that good stripping was still obtained. However, it was pointed out that on Aero we have been troubled with heater after stripping trouble. Dr. Carlton stated that it was their opinion that the layer of emulsion next to the sub layer did not move appreciably, but that top layers of emulsion showed the greater movement.

Mr. Seel inquired what would be the effect on subbing of #4A and 10 machines, and it was stated that we would have uniform drying but it would be necessary to sub stronger. Mr. Seel then stated that this would be a bad feature in connection with brittleness on Safety Portrait and XRay, and requested that an experiment be run comparing Portrait and XRay coatings made on #4 machine with corresponding pieces in the regular alleys, testing out various stages for stripping and brittleness.

In connection with temperatures of emulsion coatings, Mr. Wells noted that a glue is used in Stripping Film work which is a poor setting agent, but that successful sticking was obtained. Mr. Seel noted that some advantages in subbing might be secured by mixing glue and gelatin similar to an experiment now being run on Stripping Film.

In connection with the stripping of XRay emulsion from the Roll Coating NS gel, Mr. Couch stated that if 30 or 40% glue were added to the NS gel it might soften it enough so that the emulsion would give improved adhesion.

Dr. Nadeau recalled that Mr. Vacher, at the time of his last visit; stated that Vincennes regularly made practice of specifying emulsion coating conditions to be compatible with the support. At Kodak we were under the impression that faster drying improved stripping, whereas Mr. Vacher stated that if they had questionable support, drying had to be maintained on the slow side to secure good stripping.

C O

Some time ago it was noted that a yellow color effect appeared on nitrate film on plate coatings which were hand subbed and incubated. This yellow color appeared in the case where our chemical #1 (salicylic acid) was used. This yellow color also appeared in a series of acetate tests submitted by Mr. Thorne, which were subbed with the same subs. This also happened where recovered #7 was used, the type of chemical having nothing to do with the appearance of the yellow. In fact the slight yellow color was noted on two unsubbed checks, where recovered #7 was used in making the dope for the plate coatings. It, therefore, appears that in the case of these acetate coayings, the factor that cuased yellowing was found in the recovered #7 and not in the sub. Another series of plate coatings has been planned on PR dope where various chemicals are used in the sub, where both new and recovered #7 will be used in the makeup of the dope.

DS Gel on XRay

Mr. Babcock reported that 10 rolls of Safety XRay had been delivered where DS gel was used in the sub. Five were coated to emulsion and two were tested for blotch static and Mr. Rupert reported OK for blotch static. Mr. Seel, ruled, inasmuch as so many other changes were going on in the XRay, that the use of DS Gel on this product should be dropped for the present time in view of the general static trouble being experienced at building #29.

Two new types of Safety XRay were mehtioned, one of which uses increased anti-static chemical and known as Class 27, and the other involving the use of a new Gentian blue dye which is more on the red shade was known as class #28. Mr. Wells noted that all rolls of class #21 should be released as soon as possible so that they could be coated up and delivered to the trade to make way for the new type XRay.

GSB:S G.S.Babcock

C O

Sub Conference of October 22, 1937

New Centrifuge

Mr. Babcock reported that since a new disk has been installed in the centrifuge the dapacity for filtration of Ucoats has increased from 1000 to 2200 lbsl per hr. The following figures were reported on the centrifuging of a 6000 lb. batch of Ucoat:

Amount of residue	0.25 lb.
Percent lost	0.25 x 100 = 0.1%

Laboratory check on percent solids.

Filtered thru clam shell	2.88%
Filtered thru centrifuge	2.90%

It was agreed that the above figures show no appreciable loss in percent solies in going thru the centrifuging process, over and above that experienced in the clam shell filtration.

It was noted that the centrifuged material was somewhat better than the filter press material, and that an even greater improvement in clarity was obtained after filtering thru the Kieffer press.

Recovered Methyl Cellosolve

Dr. Nadeau reported that the first methyl cellosolve recovered at Kodak Park would be available in a small quantity for testing purposes. The cost of recovering this material is less than 1¢ per lb. and it was agreed to run an emulsion quality test where the methyl cellosolve was used in the Ucoat.

Mr. Babcock spoke about the necessity of getting a better way of handling methyl cellosolve. At present 50 gal. drums are being used, and it is necessary to empty about 4 drums per day. It was pointed out that this material when stored in iron would ultimately discolor. This, however, can be avoided by storing in galvanized iron. Storage in iron gives rise to very slight peroxide formation which according to Dr. Nadeau should be no more hazardous than that formed in the storage of acetone or ethyl alcohol.

New Type F Cotton

Mr. Babcock reported that a 4000 lb. batch of the new type low alcohol soluble high nitrogen F cotton had been delivered and was ready for use. It was noted that the previous batch of this type had been run on #56 machine to produce some 30 or 40 rolls, and appearance, emulsion quality, stripping, and brittleness features were satisfactory. This type of cotton was designed to give us greater solubility in methyl alcohol solvent and was also easier to filter. It was subsequently decided to wait until the dye situation of the Xray machines was out of the way, which should be some time around the first of the week, at which time the new batch of cotton will be put into operation on one machine, and if satisfactory could be used on additional machines. It was decided that if this batch of cottom was satisfactory, another batch should be ordered at once, inasmuch as it takes 2 or 3 weeks to deliver. Dr. Nadeau stated that this type of cotton had been tried on Cine Safety, Cine Kodak, Recordak, Xray, and Portrait, and stripping and brittleness results had been satisfactory. Emulsion tests have also been run, a nd results are satisfactory for Xray and Portrait. With reference to the Cine Products, incubation tests have recently been heard from and are OK. Long time keeping tests have not yet come thru. Cine Safety emulsion tests have not yet been heard from.

Mr. Wells stated that Dr. Nadeau and Mr. Babcock should get ~~together~~ together, and get tests started for the new cotton on all products involving the use of F cotton.

Safety XRay

10 rolls were recently delivered using an increased quantity of salt in the NS gel, and 5 rolls were coated to emulsion. These rolls show somewhat higher fog on 6 and 9 day incubation tests, and Mr. Seel has agreed to coat the other 5 rolls to check fog results.

Ucoat application

In order to improve appearance of Ucoat application on XRay, the nickel heater was transferred from the LS Cut Sheet to the XRay machines on October 13, the centrifuge was also started on the same day on all Ucoats. On October 18, we started using Kieffer press in addition to the centrifuge, filtering about 90% of our Ucoats in this manner.

In-The-Line-Filter

It was suggested that the filter medium in the two In-The-Line-Filters now being used on circulating systems should be made of a coarser material than felt, so that it could be also used for dye solutions. and this standardize on one type of filter cloth. It was also noted that the present type felt develops sufficient back pressure to cause the pumps to leak frequently, and trouble is being experienced with the nickel shafts wearing out thru the stuffing box.

In connection with this type of filter, Dr. Eilers suggested that we should have them installed on all circulating systems. It was noted that such a filter installation removes all loose dirt accumulating in a circulating system.

Csub for M3-2501 Cine

It was noted that the special Csub being delivered for this product had to be handled in 100 lb. cans beaause of inadequate storage facilities. Mr. Babcock suggested that an experiment be run where regular C sub should be substituted for the special C sub, application to be made by Kodak hopper instead of by immersion, to see if nitrogen results would not be sufficiently low, and thereby enable us to use a standard C sub and prevent the use of loo lb. cans around the coating machine. It was agreed to run this test.

Wet Stripping Comparison of #1B and #9 Rooms.

Recently Mr. P. Bahr stated that #1 BB room was giving more wet stripping trouble on Safety XRay than #9 room. In order to check this point, the stripping results were looked up for rolls coated during the last 3 months with results as follows:

Class #21
Regular Coatings

Rolls emulsion coated in July 1937

Ro	#47 Machine		#48 Machine	
	#9 Room	#1B Room	#9 Room	#1B Room
	100 Rolls	62 Rolls	81 Rolls	71 Rolls
	90% OK	53% OK	64% OK	40% OK

Rolls emulsion coated in August 1937

#9 Room	#1B Room	#9 Room	#1B Room
76 Rolls	32 Rolls	97 Rolls	20 Rolls
81% OK	70% OK	77% OK	50% OK

Rolls emulsion coated in September 1937

#9 Room	#1B Room	#9 Room	#1B Room
87 Rolls	35 Rolls	64 Rolls	44 Rolls
98% OK	74% OK	95% OK	80% OK

Summary of rolls emulsion coated from July 1, 1937 to October 1, 1937

#9 Room	#1B Room	#9 Room	#1B Room
263 Rolls	129 Rolls	242 Rolls	104 Rolls
91% OK	64% OK	84% OK	46% OK

G.S.Babcock

Sub Conference of October 29, 1937

New Experimental Machine

It was noted that Dr. Kadeau's new experimental machine for narrow width sub experiments in building #19, had just been completed. Mr. Wells stated that Kodachrome subbing was one of the most important problems to be worked out, and X-ray was a close second. This machine should be kept running as much as possible during the day-time. It was noted that when bubble trouble was encountered in regular coatings, that this material could be set aside for the experimental machine.

Kodalith

Dr. Gould stated that the thin PAC Kodalith had just recently been delivered, and the appearance of the support was pretty good. In connection with the emulsion coating, it was suggested that if an idle roll could be placed a short distance above the emulsion roll, a better coating might be obtained. It was also suggested that after the immersion application of the emulsion, the film could be chilled on a drum, and result in a more even distribution.
It was also suggested that the 4" immersion roll might give a better application than the 2" roll. Dr. Eilers cited the experience in subbing Kodalith where the sub application was improved by going from 2 to 4" immersion roll, and still further improved by supplying more wrap around the 4" roll. Mr. Wells stated that the Emulsion people are going over this problem, and Mr. Seel would have a group discuss some experiments. In connection with the use of the drum, Dr. Carver stated that the idea had been used commercially, and was discussed in F. Wentzel's book "Photo Graphische Chemische Industrie".

Dye Test to Isolate Stripping Zone

The new dye tests suggested in last week's Sub Meeting was mentioned by Mr. Babcock who produced dye standards showing differences in intensity to be expected when samples of X-ray base, with and without NS Gel Ucoat, were dipped in the solution. This dye solution is more concentrated than other standard dye solutions, and dontains a small amount of acetic acid. It was noted that the intensity of the coloration was much greater in the case of a sample on which the NS gel had been applied. Another set of samples was exhibited, the same as the above set except that samples had been run thru the processing solution before being dyed. In this case also the sample with the NS gel application was much more intense in color. This method is offered as a means of determining

whether the NS Gel is removed with the emulsion in the case of wet stripping, or whether it stays on the base.

In an actual sample returned from the trade received during the week, the zone of wet stripping was identified by this method as occurring under the NS Gel layer, since the intensity of the coloration was very slight. This appeared to be due to the gel sub being too weak.

New Gel Sub

A sample of sub was exhibited by Mr. Babcock which featured the use of DS (deashed) gel dissolved in m-cresol instead of water. The usual amount of chemical was then added, and a satisfactory appearing sub was made up in a mixture of 90% ethylene di-chloride and 10% #12. This is the first instance of a gel sub made up without the use of water.

In Vincennes a similar procedure is followed except that phenol is used in which to dissolve the gel. Cresol was taken in this instance because it is a liquid and would show less tendency to crystallize out than phenol which is a solid.

In connection with the influence of phanol and cresol on emulsion, we understand from Dr. Dundon that the chances are good, and that these chemicals will be satisfactory. This method of making up sub will enable us to produce a still stronger sub than has been made to date from the standpoint of water content. It was suggested that it might be possible to make a sub application with this type of sub on a drum with Kodak Park hopper in subbing Safety support fairly well cure out. Dr. Carver suggested that if the phenol was used in a concentrated alcohol solution for convenience in handling, we might be able to eliminate about a year's testing due to the fact that it has been used in France.

The question of the effect of phenol on galvanized iron was brought up and it was agreed to look up corrosion tests. Mr. Wells stated that building #29 should be warned of material subbed in this way to be delivered for emulsion coating.

Mr. Babcock stated that an attempt had been made to dissolve gelating in thymol without success.

New Type F Cotton

The new 20% alcohol soluble F cotton was made up into a small batch of Ucoat for trial application on a coating machine, and it was noted that contrary to expectations, the filter time was about 3 times longer than for the regular F cotton. Mr. Babcock noted that this cotton was much worse than the first batch of low alcohol soluble cotton as far as filtration was concerned. It was decided to take this matter up with the Chemical Plant.

C O

Distilled Water

Mr. Babcock noted that the distilled water looked slightly cloudy this morning, and after checking conductivity the result of 73 x 10^{-6} was secured on a sample drawn from the tank, and a test drawn from the still showed 19 x 10^{-6}. A sample of Hemlock water was also tested for conductivity and a result of 130 x 10^{-6} was obtained. It was, therefore, decided to draw off a supply from the tank, and to clean out the still and tank as soon as possible, since it appeared that more than the usual amount of mud had collected.

X-ray

Stripping tests have been very good for the last week, although some wet stripping has been noted on the regular coatings.

Mr. Wells stated that some frilling around the edges on the SS side was being noted, and warned about not getting into blister trouble.

Safety Cine Positive Firelight

Dr. Gould reported stripping on the regular coating of Safety Firelight, although the stripping tests showed OK. Three experimental sub tests are coming thru where strong, weak, and medium subs are used.

London X-ray

It was stated that tests on London X-ray had been OK for the last 2 or 3 weeks, ever since the sub was weakened.

New Nickel Heater

A second nickel heater for Ucoat regulation has been installed in the north end of the hallway. This means that a better temperature control will be established for both portrait and X-ray U-coats.

LS Cut Sheet

Mr. Babcock stated that since changing the LS from class #2 to class #3 the first rolls were coming thru OK for stripping.

Nitrate Cut Sheet

Recently a few rolls have shown some dye retention on Nitrate Cut Sheet, and the sub has been adjusted to take care of this.

C O

Kodachrome

Kodachrome stripping tests continue to show dry stripping, however, after the regular coating results are slightly better.

Sub Pump

The new sub pump has been running in the Roll Coating Department for two weeks with 2 or 3 shutdowns. It has run as long as a week without plugging up. The shutdowns were due to failure of the mercury switch to make proper contact. The disadvantage of this pump, at the present, is that the coil heats to 140F. It has recently been determined that if the current is allowed to stay on, the coil will heat to 300F. The pump has, therefore, been discontinued temporarily, and a pump of new design will be shortly installed where this heating effect is largely eliminated.

It was also noted that Mr. Crouch had secured some prominent type magnets made out of special alloy steel which might be used to raise and lower the piston, and thereby, secure a pumping action.

Bloom

Bloom troubles on #43 machine have shown much improvement over the last 2 weeks. Use has been made of a sub hopper with shields over the roll to cut down evaporation of the sub, and this appears to be a good thing.

Brittleness.

Nitrate Cine Positive Brittleness during the past two weeks has varied between 3 and 5 %.

Tackiness

Dr. Robinson summarized some of the results secured on this study regarding tackiness, stating that the principle thing to be accomplished in order to relieve tackiness situartion was to get the sub hoppers working correctly. Standpipes have been installed on the hoppers, and raised the level of the sub to a point where it flows over the dam for the entire length of the hopper. This permits a more even distribution, and consequently less accumulation of gel and camphor at north end of the hopper. In a further discussion it was agreed that somethihg more shoulc be done about plugging up the slit cut at the end of the dams for convenience in cleaning;e.g., it would be possible to remove the cleaning water from the dams by means of a suction tube, thus eliminating the necessity of turning the hopper over.

GSB:S G.S. Babcock

C O

Sub Conference of November 5, 1937

Safety X-ray

Dr. Gould exhibited some samples of X-ray which showed "rabbit track" trouble. During the past week this defect has been particularly bothersome in the finished film, in fact on one machine 45% of the production carried this defect. Dr. Gould stated this defect did not show up when flashed with white light or with X-ray screen, but X-ray flash showed up the trouble. He stated that this seemed to be a type of repellency in the application of the NS gel on emulsion which might result in extra pickup of the emulsion at certain zones during the coating. Mr. Couch stated that he believed this defect might be a midification of a defect noted on paper subbing called "diagonal dots." Mr. Babcock stated that "diagonal dot" trouble was formerly noted on Safety X-ray in the application of the regular sub, and that we were able to be rid of this trouble by warming up the sub. Mr. Couch stated that this same procedure was used in paper subbing to remove this difficulty.

Dr. Gould stated that an experiment was being run where increased percentage of methanol was used in the NS gel in order to decrease the tendency to foam. This change may result in less trouble from rabbit tracks privided the experiment is satisfactory from emulsion quality standpoint.

Dr. Carver thought that this trouble might be due to unevenness of emulsion, inasmuch as this trouble only occurs on the flash test; in other words, we were mearly taking a picture of the thickness of the emulsion. He also stated that there was a big difference in sensitivity of the emulsion near the base.

An experiment where the salt was increased from 5 to 14% showed an increase in fog from .11 to .15 on 6 day test. Mr. Seel ruled that this increase was too much, so two other experiments are on the way thru with 8% and 11% salt. The purpose of this experiment is to improve static trouble in building #29.

Another attempt has been made to weaken the sub on #47 machine from F to FG, however, recently these tests have been showing some wet stripping, and has been necessary to go back to F.

Methyl Cellosolve

Mr. Baybutt wrote us to the effect that there is no fog test provided for methyl cellosolve, and it was agreed to get some fog results and also some NH_4AgO.

C O

LS Cut Sheet

Two rolls have been held for surface lines during the past week, and six rolls have been held for wet stripping. The samples of the rolls held for wet stripping were coated to XRay emulsion in the absence of Portrait, and after taking retests and coating to Portrait emulsion, two out of three tests came OK. It is possible that we will need to watch more closely for stripping troubles, inasmuch as the C sub has been recently been dropped off.

Mr. Babcock stated that it might be possible to decrease or eliminate the use of methyl cellosolve in the Uccat of LS Cut Sheet, inasmuch as the C sub has been eliminated, which latter was the source of much of the poor appearance. It was noted that if the methyl cellosolve was omitted, it might be necessary to return to bottle feed on the OS side in order to prevent stripping of the Uccat from the base. However, this is something that would have to be tried.

London X-ray

This product is running along particularly well at the present time as far as stripping is concerned.

Nitrate Portrait

Recently a few rolls showed a little more than the usual dye retention. This condition has been corrected by altering the sub.

New Type F Cotton

Mr. Babcock reported that the new type F cotton had been tested out on one machine, and stripping and brittleness results were normal, however, filtration time was three times longer than normal F cottons. This type cotton was supposed to be advantageous from the standpoing of filtration and haze. Messrs. Folwell and Sillick have been informed of this filtration trouble, and we were advised to use B portion of batch #288 rather than the A portion which gave filtration trouble. This has been done, and we find that B portion has been quite satisfactory for filtration. Mr. Sillick thought that the alkali wash was responsible for most of this filter trouble, and the Chemical plant will watch out for this in making up the next batch, inasmuch as we are desirous of getting into the use of this cotton in regular production.

G. S. Babcock

Sub Conference of November 12, 1937

Safety X-ray

Samples were exhibited which showed the effect of an NS Gel application in which sulfur-free rubber had been allowed to stand in the NS Gel solution over night, and in another case where new filter felt was left overnight in the gel solution. Both of these samples after being flashed, and developed were comparitively free of dirt, and showed no evidence of rabbit tracks. It was concluded that in future tests, samples should be subjected to straight X-ray flash.

In connection with static trouble at building #29, it was noted that the experiments using 8 and 11% salt were on the way thru, and the results should be on hand before the next meeting.

Haze

Mr. Babcock showed samples of X-ray which had been coated on #89 machine in which comparisons were made between blends of F cottons for haze. It was noted that the regular sample coated on #56 machine from blend #156, which contained no NS Gel, was worse looking than a comparative sample on #89 machine, although it was felt that in general the coating on #89 machine was fairly close. Dr. Nadeau will endeavor to alter his subbing condition on #89 machine so that samples obtained will correspong with those from the regular machines.

New Type F Cotton

Mr. Folwell has been asked to make up another batch of cotton of low alcohol solubility with 11.5% nitrogen, paying particular attention to the alkali washing which seems to play a big part in ease of filtration.

Comparison of #9 and #1B Rooms in Building #29

Mr. P. Bahr was present at the meeting at this point, and a discussion ensued on wet stripping of X-ray, and a comparison between #9 and #1B rooms in the Emulsion Coating Department. Mr. Bahr submitted some stripping test data which he had arranged in the form of a schedule that could be used as a basis for releasing rolls of X-ray. In general the practice to be followed was to have all tests coated in 1B room, which was known to give the worst results. Under these conditions we may more readily be able to select the rolls which show more tendency to strip, and provided the wet stripping is no worse than "S1", these rolls may be scheduled to be coated in #9 room with the expectation of coming OK on regular coating. On the other hand, if tests coated in 1B room show OK, these rolls could have their regular coating applied either in 1B or 9 room whichever is the more convenient. It was agreed that this schedule might be tried out for awhile to see if wet stripping troubles on regular coatings of Safety X-ray would fall off.

Mr. Bahr expressed the opinion that we were getting more

complete drying of the HS gel on the X-ray base at the present time than we were some time ago when the HS Gel was applied in the towers. He thought if the degree of drying could be modified that stripping results might improve. He also expressed the opinion that there might be a difference in the drying of the various machines, and it was suggested that building #29 run some conductivity tests on samples of base secured from various machines, and compare conductivity results with stripping results.

Dr. Eilers stated that after aging two weeks the regular coatings showed better than the tests. He stated that about nine partial rolls had been thrown out this year for stripping after being retested in building in bldg. #12.

Dr. Carver stated that the test Dr. Hale was working on to pick up the slight differences in stripping would doubtless be of help in the general stripping troubles on X-ray. Dr. Nadeau stated that he had a series of subbing tests coming along to find out how Dr. Hale's stripping curves correspond with a variation in sub strength. When this information is completed, we shall know more about the effect of sub changes on X-ray machines.

C. B. Babcock

Sub Conference Of November 19, 1937

Tab Test on Nitrate Dope

Another set of tabX tests was shown in which samples of nitrate and acetate dope were coated out on glass plates and incubated at 100C. for two hours with and without the sub application in which chemical #1 (salicylic acid) was involved. Results of these tests indicated in general two things: #1, Recovered #7(acetone) may give a yellow color to nitrate skins. #2, If salicylic acid used in the subbing, the yellow color is more intense.

Mr. Babcock pointed out that it was necessary to discontinue the use of acetone in making up gelatin subs because occasionally a batch would be pumped over which showed a tendency to precipitate out the gelatin. This is not true, however, of new acetone.

Dr. Kilers mentioned on recovered acetone, that they occasionally got a color on the NH4AGO test, but this is not true of the new acetone. He also recalled that Pathe use oxalic acid to clean up solvents from nitrites, and also mentioned that the Chemical Plant had twenty-five dope experiments along to be run on number 11 machine to secure additional information on acetone solvent,. It was decided to follow these experiments up in connection with the above question.

Recovered Methyl Cellosolve

It was reported that XXXXX tests using recovered me. sol. in the Uct had been run on #89 machine. Dr. Kilers thought we might be justified in running a couple of rolls on a large machine at once for the sake of getting some quick information of the keeping qualities of this solvent, inasmuch as recent tests indicated that the recovered solvent as well as the new material both show bad for fog and NH4AGO.

Haze Test

Mr. Babcock stated that haze tests were not being run promptly on #89 machine because of the rush of Kodachrome experiments, and suggested that if it were impossible to get out this work promptly it would be profitable to run the tests on a large machine at the time of a sub hopper change. Dr. Kilers stated that a further tie-up of the small experiments was between #89 machine and the small Emulsion Coating machine #3B. This latter machine has been busy with emulsion experiments on fast Cine Negative.

C O

New Type F Cotton

The new type high nitrogen low alcohol soluble F cotton was discussed, and it was stated that the first large production batch had not been used because of difficulty in filtration. Inasmuch as Mr. Folwell is making up another batch in which he will endeavor to improve filtration properties, it was agreed to test the poor material thru the centrifuge and Kieffer to see if centrifuging would clear up the filtration trouble. After the second batch has been produced it was agreed that we should go ahead with the program of gradually starting the use of this type of Uct on the X-ray machine.

TB and Kodalith

Mr. Couch stated that the quality of the TB base for stripping Film has not been very good. One trouble is diagonal lines. It was explained that a sufficiently strong sub should be used so that if the material was not satisfactory for TB, it could be transferred to Kodalith stock where the sub was strong enough to hold the emulsion, although there is some evidence that the weaker sub would improve the situation for general quality on TB. It was agreed that when TB support was running good that experiments should be kept off the machine, inasmuch as temperature and air conditions make a big difference in surface quality. Mr. Couch stated that the only thing necessary to correct at the present time was curl during processing, stating that the stripping time was about two minutes lower, and the glue side of the Stripping Film adheres to glass very satisfactorily, whereas our present TB film does not stick at all when the glue is applied in building #29.

Nonaqueous Gelatin Sub

Mr. Babcock exhibited some samples that had been subbed on #89 machine with gelatin subs in which the gel was dissolved in cresol or phenol after which chemicals and solvents had been added. These samples looked quite good for a first attempt. It was noted that both cresol and phenol are solvents for acetate, AP, and gelatin, but not for nitrate. It was thought that this fact might improve the adherence of gelatin and sub layers to acetate base.

As a future step in the production of nonaqueous subs, Mr. Babcock exhibited some gel sub solutions that were made up without the help of phenol or cresol, and which of course contained zero water. He stated that the gelatin was dissolved in a mixture of methyl cellosolve and chemical, after which various solvents could be added cautiously until a certain point had been passed, after which the solvents could be added freely. It was agreed that some experiments should be run on #89 machine to observe the sticking qualities of this type of subbing. It was stated that this sub might have advantages from the standpoint of bloom, due to the absence of water in the sub. Brittleness could be controlled by adding an organic nonsolvent such as ethyl alcohol to the sub to decrease the attack on the base. Dr. Eilers thought this sub could be particularly interesting on M3-2501 and on PAC Cine provided brittleness could be improved.

C. S. Babcock

C O

Sub Conference of December 8, 1937

Rabbit Tracks

Samples were exhibited by Mr. Babcock from roll 47-4384, which was coated to 5120-201-2. This roll of X-ray base showed bad optical contact on the north side while winding up at the Roll Coating machine. This roll also contains some impressions and orange peel trouble. Mr. Paddock followed this roll thru the coating and has reported back that rabbit tracks were found in the roll, but on the south side of the coating rather than the north side. This indicates that optical contact has nothing to do with rabbit tracks. However, it seems likely that impressions and orange peel might alter the tooth of the support, and be responsible for some of the rabbit track trouble noted in this roll.

It was noted that on #49 machine no rabbit tracks had been noted on 5 rolls after increasing the #12 content of the MS gel solution from 30 to 35%. It was felt that this increase in methanol would decrease the tendency for bubbles to form, and would, therefore, be an improvement from the standpoint of rabbit tracks. Dr. Eilers stated that he felt the methanol content should be increased still further to 40%, and it was agreed to run a test with 40% to observe the behavior.

Attack Power Tests

Mr. Wynd reported on the results secured to date in the investigation of improving the attack power method of determining differences in the hardness of dope. In this investigation variables such as differences in temperature of the solvent, total volatiles remaining in the support, tackiness of the support, conditioning of the support before testing, etc., were taken into account. In general Mr. Wynd felt that the results secured were not a sufficiently good indication of variation in the alcohol solubility of the nitro cotton. It was generally agreed that the attack power test was not at all times an indication of the hardness of the cotton, and it is also true that the test has not been run as a sub control for a period of a year or more. However, at such times as unusual trouble is experienced in subbing or tinting, it has been the practice to run a few attack power tests, which in some cases have been of value. Instances of these are: (1) Single subbing of AC type acetate, (2) Application of Cine Negative backing. (3) Single subbing of Kodalith PSS4 with and without acetate pulp. In connection with the alcohol solubility results as a guide, it was pointed out that these results were only obtained on the cotton coating in the dope, whereas no results were taken on the scrap. Therefore, a variation in the amount of scrap might make a considerable difference in the net alcohol solubility of the dope.

Testing Method for Stripping of SS Wire Photo

SS Wire Photo emulsion is more difficult to stick than Kodalith emulsion because of greater tendency toward wet stripping. It has therefore, been the practice to use a stronger single gel sub in coating PSS4 base for SS Wire Photo needs. Inasmuch as SS Wire Photo emulsion is very rarely coated, it was hoped that an indication of the sticking to be expected could be obtained with the use of Kodalith gel and emulsion. Comparative tests were, therefore, run with results as follows:

Set #1 - Coated to brown Kodalith gel and Ortho Kodalith emulsion.

Roll No.	Test No.	Stripping		
54-3588	82926	OK	OK	OK
		OK	OK	OK
54-3590	82927	OK	OK	OK
		OK	OK	OK
54-3590	82928	OK	OK	OK
		OK	OK	OK

Set #2 - Coated to SS Wire Photo Gel and SS Wire Photo emulsion.

54-3588	84042	OK	OK	OK
		OK	Str Le	OK
54-3590	84043	OK	OK	OK
		OK	Str Le	OK
54-3590	84045	OK	OK	OK
		OK	Str Le	OK

Set #3 - Regular coating to SS Wire Photo gel and SS Wire Photo emulsion.

	Em.No.			
54-3588	6129-5-1	OK	OK	OK
		OK	StrLeS120-40"	OK

It was therefore, considered essential that SS Wire Photo emulsion should be obtained for testing the base, and arrangements have been made with Dr. Carlton to secure this emulsion for the test coatings, which can be done by giving him 48 hours previous notice.

Sublines

Sublines on XRay were discussed, and it was generally agreed that this trouble arose from the use of a water soluble red dye, which was used in connection with a water insoluble blue dye to produce the proper shade of color. Arrangements are being made to replace the water soluble red with a water insoluble red, and numbers of the first rolls are as follows:

47-4456	49-915	55-8832
48-2774	50-9775	56-825

It is expected that subline condition will be much improved in rolls higher than the above.

Testing New Batch of Glyptal for Translite Sub

New batch of glyptal BR7682-1206 with M.P. 102.5 and Acid No. 105 was tested in the last Translite coating. Results are as follows:

Roll No.	Test No.	Sub	Stripping			Brittleness Undeveloped		Brittleness Developed	
54-3349	82919	St.X1676 both sides	OK	OK	OK	34	90	100	100
			OK	OK	OK	40	100	100	100
54-3349	82920	" " " "	OK	OK	OK	10	30	80	90
			OK	OK	OK	30	30	100	100
54-3347	82924	X652(ek) " "	OK	OK	OK	0	0	80	80
			OK	OK	OK	30	60	100	100
54-3348	82925	" " " "	OK	OK	OK	0	0	90	90
			OK	OK	OK	10	10	100	100

The above roll with new batch of glyptal was subsequently included in a regular coating with the following results.

	Ctg. No.								
54-3349	5561-52-1	X1676nboth sides	OK	OK	OK	50	80	90	80
			OK	OK	Vsp100		100	100	100

Testing department reports that speed, fog, and quality of this roll are OK.

Comparison of Brittleness Results on Portrait Film

Samples of regular coatings from both PR116 and M1-2000 film were processed and examined for brittleness comparison between building #7 conditioning cabinet at various relative humidities with low humidity room in building #14. Results are as follows:

			Bldg.#7								Bldg.#14			
			65F. 21%RH				84F.14%RH				80F.10%RH			
Roll No.	Emul.No.	Cls	Along		Across		Along		Across		Along		Across	
54-4010	5101-577-F2	2	30	20	0	10	10	0	0	0	0	0	0	0
54-4081	83228	3	30	0	10	0	0	0	0	0	0	0	0	0
54-4086	83289	3	20	20	0	0	10	0	0	0	0	0	0	0
54-4095	83324	3	20	10	10	0	10	0	0	0	0	00	20	0
21-5210	2114-411-F1		40	70	30	70	10	20	10	30	10	10	0	10
28-5200	2114-411-F3		25	40	20	40	20	30	10	10	10	0	0	0
21-5250	2114-415-F1		30	60	20	30	20	40	10	30	10	0	0	0

			Bldg.#14			
			70F.10%RH			
Roll No.	Emul.No.	Cls	Along		Across	
54-4010	5101-577-F2	2	0	0	0	0
54-4081	83228	3	0	0	0	0
54-4086	83289	3	0	0	0	0
54-4095	83324	3	0	0	0	0
21-5210	2114-411-F1		30	0	40	0
28-5200	2114-411-F3		10	0	0	0
21-5250	2114-415-F1		10	0	10	0

hardened gel subs.

Mr. Babcock reported a set of data on experiments employing mixed gel-glyptal subs to reduce wet stripping and give a wider range of brittleness. Since it is felt that batches of glyptal cannot be duplicated, Mr. Babcock asked that some experiments be run on 89 machine comparing different batches. This will be done.

S Kodachrome

Dr. Gould reported some dry stripping on S Kodachrome using either CD or D sub with polyvanitrate U-coat on M-3-2501 base. On the PAC base there has been no trouble from stripping. The stripping was found to be between the emulsion and the sub layers. Dr. Nadeau suggested strengthening the sub, since CD was a little better than D sub. Dr. Gould said he is going to run a series of stripping tests on 53 machine soon with gel subs of different strengths because the stripping results on support from 53 machine do not agree very closely with those obtained from 89 machine. Mr. Starok suggested increasing the concentration of the X-1819 U-coat. Dr. Gould suggested that instead of increasing the concentration of the U-coat, two coats of 1819-X be applied by KP hopper. Mr. Wells agreed to this.

Miscellaneous

During a discussion of the difficulty of splicing leaders to the support from the gelation dope experiment being coated, it was suggested to use pure ethyl lactate as a cement in the future. Dr. Nadeau stated that if an M-3-2501 leader were used instead of M-1-2000, less trouble would be experienced.

G. F. Nadeau

Methyl Cellosolve

Two samples of standard Uct made with new Me. Cel. as purchased were sent to Testing Department and tested for fog on 72 hr. incubation test, results being as follows:

	Clear Half	Flash Half
#1 K1734	Very bad	Very bad
#2 K1747	Bad	Bad

Inasmuch as this type of subbing has been previously tested and found OK for quality, it appears that the Me. Cel. recovered at Kodak Park, which also shows bad for fog, may be sufficiently good quality to be used in production. As per R.C.L-2729 one full roll of Safety LS Cut Sheet using recovered Me. Cel in the Uct will be delivered after testing.

Distilled Water for Sub Making

Mr. Babcock reported that the Jewell Water Still used in Sub Making Department was searing out, and it was agreed that plans should be made to use the distilled water made in building #21, inasmuch as Dr. Nadeau had reported favorably on the quality of this water for sub making purposes.

N510 Cine - Building #20

Mr. Babcock reported that the dams in the center-feed hoppers for the N510 Cine in building #20 had been plugged up to accomplish a more even distribution of the sub, and since this had been done it was possible to run #42 machine using one sub bottle for the inlet, whereas up until this time it has been necessary to use two sub bottles. If the rest of the machines behave in a similar fashion, we will be able to affect a saving in sub, as well as assuring ourselves of improved distribution in the hopper.

DS Gel on Tech Port.

Two rolls have been delivered of waterboxed material, and are waiting to be coated. Mr. Wells pointed out that the non-waterboxed material made in building #53 might come into use in the near future, and this type should be included in the DS gel testing.

TB Base

The trouble with surface defect on TB Base was discussed, and it was concluded that this material was being made passable by the introduction of the new immersion pan in which the bearing surface of the cups is built up slightly so that a more shallow immersion results,

C O

Translite

In a recent regular coating it was noted that one roll of Translite was made on Translite base and the other on Kodalith base. The Translite film was practically free of brittleness after the development, whereas the Kodalith was very brittle. It has been determined that the Kodalith base in the above coating was wide material, whereas the Translite was a narrow roll. A ruling has been made that wide ~~Kodak~~ Kodalith should be used for Translite coating until such time as an opportunity presents itself in building #53 to make another coating of wide Translite, inasmuch as the stock of wide Translite is depleted at the present time.

Brittleness on M3-2501 Cine

The brittleness on M3-2501 Cine Positive for the last 100 rolls has been running anywhere from "Ec/Ec" to "Br/Br", all using GH sub. Stripping in general is satisfactory.

Uct Applied on X-ray

The use of voile to cover the perforated Uct feed tube which rests in the bottom of the sub pan has been proposed as a substitute for bolting silk, inasmuch as bolting silk costs $3.50 per yard compared with 89¢ per yard for voile, this is being tried at the present time.

The elimination of the perforated feed tube in the sub pan is also being tried out inasmuch as the nitrate content of the Uct has been considerably reduced during the past several months, making a less viscous solution somewhat easier to apply.

Since the introduction of the circulating systems and the centrifuge plus Kieffer type filter, the Uct consumption has decreased approximately 33%.

New Type F cotton

It was stated that another batch of this cotton will be delivered to us in approximately 10 days, and it was decided to wait until receipt of this batch before introducing on the production machine. It was also desirable to defer the use of the new type cotton until the subline trouble had been cleared up.

G. S. Babcock

SUB CONFERENCE OF DECEMBER 10, 1937

Safety X-ray

One special roll of Safety Xray has been delivered which was subbed the same as standard class #28 product except that no HS gel was applied. This roll was delivered for "No Screen Type X-ray". This roll was to be used for a special emulsion coating which is designed to match the present Agfa X-ray, which has a heavier emulsion layer and no screen is required. This product is reported to be giving a very good quality after development. Preliminary experiments indicate that the application of HS gel results in a streaky condition at building #29 with the new type emulsion, which is the reason for omission of the HS gel.

In order to improve brittleness mx # 49 machine has been using weaker sub, FG, for 10 days with success, and now #48 machine is going to FG. On 3 previous attempts to make the same move it was necessary to go back to F sub because of wet stripping.

Improved Sub Application

Standard speed of sub roll is 18 to 22 r/p.m. Recently an experiment was run on the application of Cine Negative backing in which speed was decreased to 6 to 10 r.p.m. This move apparently has improved the application. Mr. Babcock noted that this method had been tried several years ago on the old type CSA X-ray in which speed was reduced to 5 r.p.m. in order to improve application of C sub at the time we were in sub line trouble. The slow speed gave us greater freedom from air bubbles.

It was agreed that if sub roll could be run at slower speed without danger of sub skips that practically all the sub reaching the bead could be taken up by the support and would, therefore, be applying fresh sub over an extended period of time, whereas with higher speed the rotation of sub carried away from the support on the down side of the roll would contaminate the sub in the hopper, resulting in an application of sub and extraction from base. It was pointed out that it would be necessary to weaken the sub in order to obtain sub strength equivalent to present practice. It was also pointed out that there would be less variation of sub from one end of the hopper to the other. In connection with improved type of sub, the Spicer Dufay hopper was mentioned, together with a combination of Kodak Park type and Spicer Dufay, also a submerged squeegee to remove surface slime from the sub roll.

Dr. Nadeau mentioned that he had a hopper sketched up which he thought would take care of the unequal dispersion of sub across the hopper. This involves the principle of a floating dam which would

always be level, and which would, therefore, spill the sub over evenly at various points along the edge of the dam. The question of recirculation of sub was brought up, and Mr. Babcock reported that this was being done at the present time with nitrate Uct in nickel system, but that this had not yet been accomplished on gel sub because of necessity of silver or glass containers. Another obstacle in the way has been the construction of a suitable pump, and Mr. Babcock reported that the magnetic type silver had been prefected to the point where it could be used on the machine and that we would shortly be in a position to try some experiments on the circulating of regular sub. Mr. Seel suggested the use of tantalum. Dr. Carver explained that one of the advantages of this type of pump is that we would be able to get away from the use of stuffing boxes. Mr. Babcock pointed out that the magnetic coil had been developed to a point where a maximum of 130F surface heat was obtained if the current was left on continuously with intermittent operation, the the coil is scarcely waam to the touch and has been passed by Mr. Armstrong as OK to use from a safety standpoint. Mr. Babcock suggested that a Spicer Dufay method should apply a fresh sub, and Messrs. Wells and Wynd suggested a combination of Kodak Park hopper and Spicer Dufay type. It was thought that if the roll could be fed by Spicer Dufay hopper that the objectionable sub lines hitherto experienced with the Spicer Dufay type might be taken care of. It was finally agreed that a recirculating system might offer the same advantages as a modified application hopper.

LS Cut Sheet

Mr. Babcock noted that there was somewhat more than the usual amount of haze on LS cut sheet although the Ucts were now well filtered all going thru Karl Kieffer press. This meanss that filtration should not be ascribed as a cause for haze in the present instance but rather from blushing or incompatibility, etc. Dr. Eilers noted that plans were underway to produce better ventilation under the pans where Uct was being applied, which would result in an improved air condition which should help along this haze question, and Mr. Seel stated that he was in favor of spending $500 on one machine to prove this out.

#3 Title Stock

15,000 ft. of Title Stock held for cinches appear to be passable to transfer to News as far as stripping and curl are concerned. Mr. Babcock pointed out that the sub used on this Title Stock involves the application of 50% of regular amount of gel.

Coating of Tests at Bldg. #29

Mr. Babcock noted that Building #29 had recently been instructed not to coat any tests except at the washup period. The purpose of this order was to improve the uniformity of the thickness of the emulsion coatings. However, Mr. Babcock stated that this would be a serious drawback in the promptness of reporting and releasing film base product from the standpoint of stripping and brittleness. It was noted that if it was necessary to continue the above order it would be essential to set up a special coating machine for the production of these tests.

Stripping Experiments on Emulsion Coatings

Messrs. Carver, Wynd and Hale began a discussion of experimental work done on emulsion coatings of Safety X-ray. Dr. Nadeau delivered two rolls of X-ray from #89 machine which were subbed with D, E, F, G, and H sub. Each sample was coated to emulsion at various wet bulb temperatures, and there was not an appreciable difference in wet stripping characteristics from sub to sub. Previous experiments have definitely brought out the fact that a low wet bulb temperature at time of coating is an improvement from the standpoint of wet stripping over a high wet bulb temperature within certain limits. This is a further indication that the strength of the sub on X-ray fundamentally and within comparatively wide limits is not the criterion on wet stripping, but that the temperature of the emulsion drying is an all important thing. Mr. Seel inquired about brittleness results on the above set, and it was noted that insufficient amount of samples had been delivered for this determination. Mr. Seel asked that brittleness results be taken as soon as consistent with the development of this work.

In connection with regular production, Mr. Seel suggested that the brittleness results on X-ray for the last two months be averaged and compared with the average brittleness results of last winter at 10% R.H.

Further discussion on the experiments recalled the coatings made at various wet bulb temperatures on regular production X-ray of which one roll showed consistantly good wet stripping results and the other bad. Of the two above cases, Dr. Hale pointed out that the roll showing good results on regular tests continued to show good results at various wet bulb temperatures of coating, whereas the poor roll showed definitely worse results on the wet bulb coating.

It was brought out that a year ago we were using GH sub for subbing X-ray, whereas we are now forced to use F sub in order to obtain good sticking.

It has also been our experience that good wet stripping results can be secured on short test pieces coated on a regular coating machine with an identical range of sub (i.e., from D to H) as reported in the first paragraph above.

After the first above considerations are weighed, it appears that there is something in the application of the sub which is definitely tied up with wet stripping troulbe.

C. E. Babcock.

C O

Sub Conference of December 17, 1937

X-ray Brittleness

It was reported that brittleness tests run on PSS4 X-ray in building #14's dry room at 10% R.H. all showed zero. It was again suggested that a 200 series gel sub be used on the X-ray support believing that there is some merit of a use of a 200 series gel sub in order to improve the brittleness, and insure OK wet stripping. It was pointed out that a 200 series gel sub was used some time ago, using cold water on the hopper jacket in order to reduce the temperature of the sub. The cold water apparently caused a crystallization of the chemical tri-phenyl phosphate making this process rather undesirable in production.

Mr. Babcock suggested using higher nitrogen content, stating that it improves brittleness. Dr. Nadeau noted that they had many instances where everything was controlled except nitrogen content, and have been unable to find any correlation between stripping, brittleness, and the nitrogen, if you go above 1% nitrogen. Dr. Eilers stated that if increased nitrogen would help [redacted] brittleness, it may be detrimental because of color defects primarily because the color assumes the pattern of the Uct and heavier Uct causes more defects, diagonal lines, etc., and it was suggested that the color be applied under the wheel on PSS4 and then a heavier nitrate Uct could be applied to the X-ray base without the color defect, and this will be tried on #46 machine as soon as X-ray is coated on that machine.

Mr. Wells suggested that experiments be run on #89 machine using the AP cotton with the hopes of improving the brittleness, and submit to the trade a much more rigid X-ray film.

Brittleness results taken in 1934, 1935, and 1936 were reported by Mr. Babcock as follows:

Date	Class	Av.R.H.	Tests	Av.Britt.%OK
Aug. 1934 - April 1935	9	11.7%	87	22 23 28 29
Oct. 1935 - Feb. 1936	Blue AA	11.9%	411	24 28 21 25
Jan. 1936 - April 1936	9	13.3%	538	25 15 17 9

Mr. Babcock reported that on class #9 X-ray we used Hercules half second cotton.

In connection with brittleness, Dr. Nadeau reported the following: They compared tensile strength against brittleness. On the data collected on various experiments, brittleness and tensile strength were very definitely related. On AP, by using AP2500, old type, the tensile strength was comparable to PSS4, flatness was not quite as good, but not consistantly different than M1-2000. They ran tests subbing each with a nitrate Uct and Gel sub, and the first indications were very definite that brittleness can be made just as good as PSS4. M5-2000 dope subbed with nitrate and gel sub can produce X-ray that is equal to PSS4 in brittleness, and almost as flat as M1-2000.

A set of tests, which is a repeat of the M5-2000, is on the wat thru, and if OK the Acetate Conference will probably have another dope experiment started to get a little further justification in moving in that direction.

Mr. Seel asked if M5-2000 could be checked against some of our regular film at 10, 12, 14, and 16% R.H., and Dr. Nadeau said that they coated M1-2000, M5-2500, and PSS4 together with Nitrate and Gel sub, and the brittleness was checked over the range of subs. Dr. Carver suggested running brittleness on pin machine.

Dr. Nadeau noted that if we get off AP2000 and use AP2500 type, we have a chance of getting non-brittle support.

Fully esterified AP has the greatest tensile strength. Brittleness and tensile strength are better in the direction the support is coated or lengthwise. Mr. Babcock asked if tensile strength could be increased by putting heavier nitrate Uct on both sides, and Dr. Nadeau replied that with practical adjustments it might accomplish something.

Mr. Seel emphasized the fact that AP support was satisfactory for stripping and outstanding for flatness, and it was desirous to go back to it.

A mention was made that our stripping standard might be too high and Dr. Kilers noted that we have a "peels hard" standard now, but cannot operate at "peels hard" dry and "OK" wet.

In connection with the brittleness problem, Dr. Kilers asked about the use of Glyptal, and Mr. Babcock reported that it is OK on Translite, but on X-ray film the emulsion adhesion is poor.

Mr. Seel suggested that Dr. Nadeau get out his records and pick out some of the best types that they may be reviewed.

Dr. Carver asked why the sub (using mixed nitrate and gelva) used on Kodachrome would not be OK for X-ray, but Dr. Nadeau said it has no virtue as far as brittleness is concerned.

Kodachrome

A 500 ft. roll of 16mm. Kodachrome was run using sub containing mixed nitrate and Gelva. Stripping and dye retention were OK. Wear and tear tests are on the way thru. 35mm. tests will be ready this afternoon

At this time Dr. Nadeau suggested that when dope experiments are run they should also be used as a rubbing experiment.

Coating of Tests at Bldg. #29

Mr. Babcock reported that since tests are not coated until a washup, we have had no complaints on delivery of rolls for stripping, but the chief trouble was with the dirt tests. Mr. Wells said that he talked with Mr. Cook who stated that because of the variation in speed on the Cine Positive emulsion between rolls, it was impossible to coat tests except before washup, but thought that some provision could be made to use a different alley for coating the dirt tests. Dr. Eilers suggested when they find dirt, that they take the second roll and have it coated and strip tested right away. Mr. Wells stated that he would talk to Mr. D. Babcock to see if he could have the tests coated in some other alley.

G. S. Babcock.

Sub Conference of December 31, 1937

Rabbit Track Pattern

Mr. Babcock called attention to a letter he had written to Mr. Paddock on December 15, in which a roll of X-ray, 47-4384, was coated which showed bad optical contact on the north side of the roll, and which also had impressions and orange peel, which appeared to come in clusters. This roll, after being coated to emulsion, was reported by Mr. Paddock to show "rabbit tracks" which appear on the side opposite to that showing optical contact, which would appear to indicate that bad optical contact is not a cause of rabbit tracks, but that impressions and orange peel may be.

On December, 29th, Mr. Babcock wrote another letter to Mr. Paddock calling attention to roll 50-9889 which showed orange peel and impression trouble, and which also seemed to come in clusters. On December 30, Mr. Paddock notified Babcock that the test on this roll was coated as #96669, and that it showed "full of rabbit tracks". It was noted in connection with the subbing of the above roll that the trouble seems to come from #1 hopper place which applied NS gel to the SS side and which was the last hopper position in the coating. Examination of the bead during machine operation disclosed a bulgy effect which seemed to travel back and forth over a limited distance, and which previously had been noted in connection with diagonal dot trouble. This roll, however, did not contain diagonal dots, but it was felt that the bulge in the bead might be responsible for either diagonal dots or rabbit track trouble. For instance, the area surrounding the bulge would apply slightly more NS gel which was not dried down quite satisfactorily and would stick to the dryer next following, thus causing impression and orange peel trouble, which might later be manifested as rabbit tracks after coating to emulsion.

Samples of the base before and after coating to emulsion were exhibited, and the uncoated sample was marked in ink with circles showingX the location of orange peel and impresssion trouble. When the sample from the Testing Department was superimposed on this sample the location of the rabbit tracks showed a very good match with the inked in circles.

Dextrin for Glue Solution

Mr. Couch said that the last dextrin glue solution was browner in color than the previous batch, and it was noted that this was the first batch incorporating a new lot of dextrin secured from the Paper Department. It was decided that specifications for dextrin should be set up at once so that a uniform product could be supplied indefinitely.

Haze Tests

Mr. Babcock showed samples of X-ray support which were coated on #89 machine and which involved the use of separate F cottons made up in the Uct formula. Five samples looked good and three samples fair. After the above, the five good samples were put together as a blend in a Uct and also the three fair samples in another blend, and these were run on #89 machine on another occasion, but very little difference could be found between the two as far as haze was concerned. This pointed to machine conditions as being a big factor in the production of the haze in these coatings. It has been noted that when the windows are kept closed the samples are better in appearance. It was the feeling after examining the above tests that if cottons looked good made up separately in Uct that they would not necessarily look as well if mixed in a blend and applied as a Uct, although it was pointed out that in one case a cotton of 90% alcohol solubility was mixed with another of 60% alcohol solubility and the same amount of clarity noted.

It was finally decided that when testing F cottons for haze that a blend should be made up and run on #89 machine, and a check run against the blend that was being used. If the test comes equal or better, the proposed blend is OK to be used; if the test comes worse, another test should be run on a regular coating machine. In the meantime Dr. Nadeau would carry on some tests on #89 machine to see how conditions could be varied in order to produce a match with the big machine run.

Mr. Babcock noted that some time ago the question had been asked if the Chemical Plant could make an F cotton more compatible with ethylene chloride than our present type. Mr. Folwell had some samples made up in two solvent combinations as follows:

(a)	90.48%	#91(ethylene dichloride)	(b)	86.96%	#91
	9.52%	#12(methyl alcohol)		13.04%	#18

A series of cottons was dissolved in each of the above two solvent mixtures and are graded as follows for solubility:

Solubility	Cotton	Nitrogen
Best	H510	11.9%
Second best	F288A(low A.S.)	11.5%
Third best	PR	12.2%
Worst	F289B(high alcohol solubility)	11.0%

It would, therefore, seem that the use of the low alcohol soluble cotton should be an improvement from the standpoint of haze when used on M1-2000 coatings. Inasmuch as the cotton has already been proven equal to or somewhat better than the high alcohol soluble type when used on PSS coatings, it appears that this cotton should be a general improvement from the haze standpoint. To date stripping and brittleness and results show it to be equal to 80% high alcohol soluble type.

Mr. Babcock stated that 8,000 lbs. of the low alcohol soluble type had been produced and we were in a position to start the use of this cotton on our X-ray machines. It was decided to go ahead with this during the coming week.

Stripping on M3-2501 Cine- Acetate Propionate Support

It was noted that more than the usual amount of stripping had been occurring recently on #53 machine coating M3-2501 Cine whereas #52 machine conditions were somewhat better. It was pointed out that on #53 machine the production of Safety Cine was frequently interrupted for the production of other products such as Cine Negative Blue, Microfile, Firelight, and Blue SR Kodachrome, and that stripping was undoubtedly worse because of these interruptions. It was decided to increase the strength of the sub from G to FG to get out of this trouble.

LS NC (Low shrink NC)

It was noted that we were having complaints on comblines on #47 machine coating LS NC. Under these conditions of coating a great deal of heat is driven up to the front of the machine, this causes sub throwout and combline trouble. This is a case where a separate sub chamber on the coating machine or a reprocessing machine would improve quality of the product.

Brittleness Comparison

Mr. Babcock noted that average brittleness results secured to date for 1957 were comparable with these secured during the winter of 1956, although results were considerably below those secured on class #9 and Blue AA types.

The above results were secured by averaging some 400 tests made on full roll coatings.

It was noted that average percent nitrogen had dropped from 0.18 to 0.15%. The complete results are given in Mr. Babcock's letter to Mr. Seel under date of December 29, 1957, a copy of which was mailed to all members of the Sub Conference.

Brittleness Test on #89 Machine

Mr. Wells inquired about X-ray subbing tests being run on #89 machine with particular emphasis on improving the brittleness situation, and Dr. Nadeau stated that his experiments indicate that M5 type dope looks a little better in this respect than PS84, and at the same time the flatness improved. He stated that we should be able to coat this type of dope at the same speed as PS84.

Mr. Babcock showed the results of some tests that Dr. Nadeau had run on #89 machine in which various combinations of gel and glyptal were used for subbing. It was noted that this type of subbing gives us the desirable dry and heaterafter loosening effect that is essential for good brittleness results. Dr. Nadeau raised the question as to whether the stripping would be of the shattering type so that it would be impossible to cut in sheets without loosening the edges. The only way to prove this out is to have some pieces coated to emulsion. Samples of Translite base subbed with

gel-glyptal combinationwere exhibited that had been coated to X-ray emulsion both sides and cut thru the processing solution. Stripping results were on the order of "PeelsH, OK, PeelsH", brittleness being 100% OK. It was pointed out that the use of glyptal in single gel sub tends to have a beneficial effect on wet stripping troubles at the sacrifice of dry stripping. It was decided to run additional tests on this type of subbing to see whether or not the stripping could be improved somewhat without a great drop in brittleness. It was also agreed to run a few experiments with a non-aqueous type gel to see whether this would offer any improvement from the brittleness standpoint.

It was decided to increase the drawoff of the circulating systems in view of the fact that percent #47 (tri-phenyl phosphate) seemed to be on the increase, analyses showing that it averages about 1.35%.

LS Portrait

It was noted that the methyl cellosolve in the LS Portrait Dot had been increased from 12 to 15% to improve haze.

GSB:S G. S. Babcock

C O

Sub Conference of January 7, 1938

Cine Safety M3-2501 (acetate propionate base)

Dr. Eilers exhibited some strips of Safety Cine Positive made from M3-2501 dope to observe warping, buckling, and curl. Comparison was made with regular PAC 47 check. Mr. Wells stated that the backing was being applied nearer to the windup on #52 machine which gave a shrinkage of about 1.4 as compared with 0.9 on #53 machine where backing was applied in the middle of the machine at #3 place. Apparently this material will be no worse than PAC for shrinkage, and shrinkage amplitude should be better. Mr. Seel suggested that this data be reviewed with Dr. Carver on Monday morning.

In connection with finished coatings on M3-2501, Mr. Babcock reported on 20 rolls which showed various degrees of brittleness running from "Ec/Ec" to "Br/Br", but unlike the first set reported, six rolls showed "PeelsH" to PeelsLe". It was reported that in the testing of the above rolls, a satisfactory stripping result was obtained, although in a few cases it was necessary to take two retests before the test came passable. Mr. Seel stated we would not let any of the above questionable product go out, but that it might be used in Kodak Park.

X-ray

It was stated that, following up discussion of last Sub Meeting, #49 machine had been started on K200 type sub which came thru Ok for stripping, brittleness results being comparable with regular production. Yesterday the sub was weakened to KF 200 in an effort to improve brittleness.

It was noted that the management was becoming concerned over the cross line situation on Safety X-ray base. These crosslines may be observed by reflected light after the emulsion coating has been made. Extensive work is being done to improve this condition at the present time.

New Type F Cotton

The first batch of low alcohol soluble high nitrogen F cotton reached the machines at 8:30 A.M. yesterday. No particular change in appearance of the X-ray at the windup has been noted. Mr. Babcock stated that there is less residue in the centrifuging with this type of cotton than with the regular type F cotton being used. It was agreed to follow stripping over tomorrow and Sunday in view of the above change.

Acetate Blends for Kodachrome

Mr. Babcock noted that three more acetate blends #5, 6, and 7, which are designed to be used in Kodachrome sub, had been tested out and that stripping results were dompatable with check. It was also noted that these acetate blends have been tested and found free of transparent spots.

Kodachrome

Drl Nadeau stated that the new subbing technique for Kodachrome appeared to be coming along satisfactorily. This technique involves the use of a C sub containing about 15% Gelva(based on the weight of the cotton), followed by DE150 sub. Another type, a mixed gel-acetate sub of the X1000D type, followed by gel-acetate wash does not result in as satisfactory appearance. Mr. Babcock reported that reversal stripping results on both of the above types of sub taken from 500 ft. rolls were solid OK in the case of nitrate/gelva, and Vsp to Ok thruout in the case of the gel-acetate. Two other 100 ft. experiments using gel-acetate sub followed by KF gel sub in one case at #7 and in the other case at #3 place, both showed "PeelsLe" (R.C.L.-5065).

Low Viscosity NS Gel Uct

Dr. Nadeau spoke of the low viscosity NS Gel and stated that this could be used in 6% strength on our machines as compared with 3% of the regular type NS gel. This results in a thicker coating of gel andappears to be of some help in the elimination of static in building #29. Mr. Seel stated that Dr. Nadeau should check the rolls coated of this type product to see whether emulsion quality was OK so that we could proceed on a larger scale.

X-ray (Brittleness)

The brittleness situation on X-ray was reviewed with Mr. Seel in which it was stated that comparison of 1936 and 1937 results show that all results average 0 0 0 0 at 10% R.H., whereas at 14% R.H. the brittleness figure ran between 5 and 10. The average over a large number of tests in 1937 was comparable and even a little better than for a corresponding period in 1936.

It was noted that Blue AA type of subbing showed desirable "peelsh" stripping on heaterafter tests which improves brittleness results. Mr. Seel noted that we had complaints of blisters as a result of this type of subbing, but that it was due to NS Gel in building #29 after the lapse of some time. It was finally set up that we would not hold the base longer than two weeks before coating to NS Gel and emulsion in building #29.

The gel-glyptal type of subbing also gives us "OK" wet and "peels h" on heaterafter, and shows very good for brittleness.

Several coatings made on Translite base using X-ray emulsion have shown "OK" wet stripping and "peels h" on both dry and heaterafter results, brittle tests being from 90 to 100% OK. Translite base is subbed with gel-glyptal type sub.

Mr. Seel felt that the Translite emulsion coated to Translite base was on the ragged edge for good stripping, and Mr. Babcock replied that this stripping could undoubtedly be improved in the case of X-ray emulsion coatings by lessening the amount of glyptal added to the sub, inasmuch as it is known that dry stripping improves as the glyptal is reduced.

Dr. Nadeau mentioned the subbing method in use at Vincennes, noting that FA hardener was used to regulate stripping, and Mr. Seel stated that FA hardener was not desirable because of its gradual hardening effect. Dr. Nadeau stated that he would like to run some experiments with chrome alum.

Recovered Methyl Cellosolve

Mr. Babcock reported that sufficient recovered methyl cellosolve made up for Portrait Uct was on hand today, and that it was planned to use same for 24 hours on the Portrait machines to get further tests for quality.

Slow Speed Sub Roll

A slow speed sub roll has been tried on PR and M510 Cine Nitrate and the rolls coated to emulsion are OK for stripping and brittleness. The test was run primarily to get rid of combines, and was apparently successful. Mr. Wilcox is getting an approval sheet to leave one machine on a slow rotating hopper for a while. Mr. Wells spoke about the method used on the Waldron for the continuous application of fresh sub and asked Dr. Nadeau to run another test and let Mr. Babcock see the test while running.

Leader for #10 machine

Mr. Wells asked if paper leader could be used as in coating BC, and Mr. Seel thought any nicks on the edges would be disastrous. Mr. Seel stated that #10 machine was going to have a fixed width, and Dr. Eilers brought up the point about the aging of support that shrinkage is 1/16", citing as an example that X-ray would shrink from 40-1/2 to 40-3/8". However, it was felt that #10 machine would take this tolerance. Mr. Seel mentioned that they hope to get sound recording, Positive, Robo, some of the Duplicating film coated on #10 machine in emulsion coating.

GSB:S

G. S. Babcock

C O

Sub Conference of January 14, 1938

Non-brittle Resin Uct

Dr. Nadeau stated that gelva-acryloid was the one combination that has given us practically OK stripping and OK brittleness without the apparent shattering. Acryloid resin, however, is the lowest melting of the preferred resins, and it would be desirable to obtain some other material haging the same properties of adhesion and anti-brittleness, but having a higher melting point to take care of skidding.

X-ray

A general discussion was held on the stripping of X-ray during the last week. It was noted that the sub was weakened in an effort to improve brittleness, inasmuch as dye tests had indicated that after the emulsion had stripped away from the base, that sub still remained on the base. After weakening the sub from F to GH we began to get into dry and wet stripping troubles. Mr.Seel stated that in his opinion the subs had been weakened too quickly and that results of finished coatings should be relied on rather than tests in a case such as this where general stripping was prevailing. As a result of the discussion it was agreed to strengthen the sub and to use a sub of the "200" type, inasmuch as this type of sub is thought to be more beneficial for stripping of X-ray. It was decided to start off with F200 on all machines except one, which was to be put on E200. A feature of the stripping troubles seemed to be that we were on the ragged edge of stripping, and a transfer from 1B to #9 room was sufficient to improve the stripping so that product is passable.

Mr. Seel spoke about the survey of the X-ray machines being taken by Mr. P. Bahr, in which Mr. Bahr stated that he has discovered a comparatively wide divergence of temperature particularly in the NS Gel application and thinks that something should be done to bring these temperatures closer together. Storage temperature at present is 90F. which may cool down to 85F. after having been drawn off in bottles and introduced to sub hopper at 100 to 110F. Mr. Babcock stated that it would be impossible to lower the temperature of the NS Gel in the hopper appreciably, because the gel solution would undoubtedly set up and cause application trouble. The only way left to do this is to supply some sort of heating for the NS Gel in the storage to endeavor to keep the temperature near the 100 to 110F mark. Mr. Seel read some of the results Mr. Bahr had noted in his report, and Dr. Carver commented that the variation of temperature of drawoff was greater than the variation in temperature of the feed which would indicate that the heat of the machine is causing a greater variation in the NS Gel. In order to take care of a situation such as this it would be necessary to set up a circulating system of 100-110F water for the sub hopper jackets.

Mr. Seel recalled that some three years ago the temperature of sub applications had been investigated quite thoroughly, and it was recalled that this was in connection with Blue AA application. Some of the temperatures involved on the production of Blue AA from #48 machine are here recorded as a guide.

DATE - December 21, 1955 - January 27, 1956

Date	Temp-Gel Out North	Temp-Gel Out South	Temp. MS Gel	OS North	OS South	SS North	SS South
12-21-55	105	110	87	91	90	91	89
12-25-55	95	109	89	95	93	93	91
12-30-55	99	108	85	88	88	92	87
1-5-56	102	110	87	90	88	92	91
1-10-56	105	110	86	94	92	93	91
1-16-56	110	115	87	97	95	95	91
1-20-56	100	105	86	93	90	92	89
1-25-56	105	104	85	91	90	90	88

Following is also some data taken from #48 machine in connection with the application of class #9.

Date	Temp-Gel Out North	Temp-Gel Out South	Temp. MS Gel	Sub Temp. SS	Outlet OS
1-29-56	91	93	85	112	95
2-5-56	96	98	92	114	109
2-10-56	92	96	90	104	109
2-15-56	99	101	88	112	110
2-20-56	92	95	84	110	105
2-26-56	95	99	85	109	106
3-1-56	96	100	86	104	108

Mr. Seel stated that Mr. Bahr had run an experiment in building #29 in which he had secured a different application effect by chilling down a beaker of MS Gel and pouring it in the application can during a coating. This difference in application apparently was caused by changing viscosity of the MS Gel solution. Mr. Bahr is running the same type of test on #50 machine to see if any difference in application could be secured which might give rise to an explanation of our rabbit track trouble.

Dr. Nadeau stated that he had run a series of X-ray experiments on #89 machine in which he had used a strong, weak, and intermediate strength of sub with widely different temperatures to see what effect might be noted on stripping and brittleness. Dr. Kilers noted that when these samples come back that a determination should be made of the cases that show stripping as to whether the gel was on the base or off the base. The present stripping we are in appears as though the MS Gel sticks to the base.

The following is a set of temperatures of dryers on X-ray machines.

Jan. 13, 1938 — Dryer Temperatures

3rd Place (OS) Reg. Sub	47	48	49	50	56
North	140	132	136	136	135
South	141	135	139	138	137
Thermometer	140	134	134	136	138
1st Place (SS) MS Gel	123	126	117	135	111
North	123	126	117	134	112
South	129	136	132	132	129
Thermometer					

Additional temperatures were taken on January 18, 1938 as follows:

Jan. 18, 1938

	46	47	48	49	50	54	56
1st Place (SS) MS Gel							
North	138	137	139	115	133	146	117
South	137	137	139	115	133	146	117
Thermometer	135	143	140	131	132	151	144
2nd Place (OS) MS Gel							
North	128	127	137	124	137	154	130
South	None	127	138	134	137	153	131
Thermometer	None	132	135	130	136	153	127
3rd Place (OS) Reg. Sub							
North	132	145	138	140	143	145	145
South	132	145	139	140	143	145	145
Thermometer	136	140	138	130	136	140	140
4th Place (SS) Reg. Sub							
North	138	139	136	135	138	142	144
South	136	138	136	135	138	141	144
Thermometer	138	135	131	135	136	138	142
5th Place (SS) Tint							
North	132	133	138	133	136	140	140
South	132	134	138	134	136	140	139
Thermometer	132	134	135	134	134	138	135

Jan. 20, 1938 Dryer Temperatures after Sub Application

	46	47	48	49	50	54	56
1st Place (SS) NSGel							
North	106	105	104	103	105	90	107
South	104	105	104	102	105	90	106
2nd Place (OS) NSGel							
North	129	128	120	120	155	124	111
South	129	128	120	120	154	125	111
3rd Place (OS) Reg Sub							
North	144	141	140	157	141	142	145
South	144	140	140	158	142	143	145
4th Place (SS) Reg.Sub							
North	125	151	145	155	157	150	128
South	125	151	144	155	157	150	129
5th Place (SS) Tint							
North	120	127	157	127	154	125	150
South	120	128	155	127	149	124	150
7th Place (OS) Mit.Uct							
North	144	151	146	124	144	128	124
South	145	150	145	124	142	128	125
8th Place (SS) Mit.Uct							
North	147	141	145	133	146	142	139
South	147	142	144	133	145	142	140

In regard to temperature of NS Gel in storage in the hallway Mr. Bahr, on page 16 of his report of Jan.5, 1938, reported as follows:

Crock #1 90F. Crock #2 90F. Crock #3 92F.

Since taking the above temperatures these crocks have been surrounded by metal jackets, and temperatures taken on the NS Gel under this condition were as follows:

Crock #1 91.5F Crock #2 89F Crock #3 90.5F Crock #5 91F.

It, therefore, appears that the jackets are not sufficient to maintain the NS Gel at a temperature of 100-110F, and steps have been taken to install coils between the crocks and the jackets in order to increase the temperature.

New Backings for Portrait

Dr. Nadeau stated that it might be possible to dispence with the use of Pelloid on our Portrait film by the use of a backing applied in Roll Coating, which could be leached off in processing solution somewhat the same as the Cine Kodak backings that are now being used. The main problem to work out in connection with this procedure would be to control the curl at various humidities. In connection with this Mr. Couch stated that TB base for anti-halation backing is OK for curl whether the strip film is on or off of the base.

Mr. Babcock stated that a mixture of glue and gelatin in the sub might modify the curl somewhat, due to the fact that glue if as a softer nature and might yield in a greater degree in the swelling and shrinking of the emulsion application which should show its effect in the curl test results.

GSB:S G.S. Babcock

C O

Sub Conference of January 21, 1938

Rabbit Track Pattern

Dr. Eilers stated that since the salt had been omitted from NS Gel application that rabbit tracks had been improved.

Mr. Babcock stated that another roll observed by him to contain orange peel and impression trouble had been sent thru with a request to check for rabbit track appearance.

X-ray

Mr. Babcock showed a chart of viscosity vs. temperature which was determined for NS Gel and C sub both on samples that were fresh and one week old. On this chart it was indicated that there was veryE little difference in the viscosity of the NS gel between 100 and 120F. However, at lower temperatures than 100F., the sample one week old tends to show somewhat higher viscosity, this fugure at 80F. increasing from 12-1/2 to 15-3/4. In the case of the sub however, the two viscosity curves were identical at all temperatures. The above facts confirm the knowledge that the NS gel will set up as temperatures are reduced, whereas the sub will not. Inasmuch as operating temperature of the NS gel in the hopper itself is 100 to 110F. as a rule, the application problem at this point is not sufficient in regard to viscosity to cause concern.

Dr. Eilers stated with reference to the stripping troubles on X-ray that he had changed to E200 on all machines which gave "PeelaH" dry, "StrLeSl" wet, and "OK" thereafter, which indicates the sub was definitely on the base. Therefore, separation should occur between NS gel and regular sub, or between emulsion and NS Gel. He stated that "200" type sub was giving better results than the "100" type. To support this argument he stated that in the case of No Screen X-ray where no NS Gel was applied, no case of stripping has reported bu t that static trouble shows up.

It was recalled that a year ago or so hardener was reduced from full amount to half amount to get out of stripping trouble. An attempt was then made to reduce to one quarter amount and finally to none at all. However, blister troubles with spent processing solution was developed when no hardener was used, therefore return was made to one quarter the amount. Still later the Emulsion Coating Department was bothered by statie, which was felt to be due to the tackiness of the rolls and the consequent static charge set up during unwinding, at which time the hardener was increased again to half the amount. Dr. Eilers thought if hardener was decreased to one quarter the amount on SS or #1 side that static would not be effected because this side would not be back to back as wound up in the X-ray roll.

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In order to prove whether the stripping trouble was due to separation between the HS Gel and regular sub, Dr. Carlton is coating three samples from roll s that show bad stripping both in 1-B and #9 rooms, the samples being brought up to Reeling Room humigity, thus allowing the gelating to swell before the two X-ray coatings are applied.

It was suggested to Dr. Carver that Dr. Hale might spend some of his time on stripping troubles at present connection with X-ray. However, Dr. Carver stated that Dr. Hale was working on stick marks, and the decision on this would rest with Mr. Beel.

Specification for New F Cotton

Mr. Babcock stated that he had talked with Dr. Nadeau regarding the specifications for new low alcohol soluble F cotton, and that an alcohol solubility of 25-30 had been agreed to rather than 20-25 because it was felt that we should not take chances and go below 20, and viscosity of 3-4 seconds. The nitrogen would have to be depended on the above specifications which should be in the neighborhood of 11.5%

GSB:S

G. S. Babcock

Sub Conference of January 28, 1938

X-ray

It was stated that the stripping tests on X-ray were showing satisfactory stripping results since the return to regular high alcohol type F cotton in the Uct was made. Dr. Eilers reported on some stripping tests that have been delivered last week where some of the worst examples of stripping were coated to emulsion before and after conditioning to reeling room conditions. Result of the experiments was that the samples showed worst after sendition-ing than before. It was felt that conditioning the samples put more moisture into the gel, and that either HS or regular gel stripped away from the Uct.

In connection with the testing of the low alkohol soluble cotton, it was stated that the first experimental batch was entirely used on #56 machine, and results on stripping and brittleness were satisfactory. Following this, batches 288A and 288B were produced. 288A was tested in a 5 roll coating on #46 machine and results were OK. Batch 288B gave filtration troubles, and an experiment was run in which 288B was first centrifuged and then passed thru the Kiefer press. It was determined that filtration of this material was very satisfactory by this method. Next, batches 294A and 294B were produced, after which a blend of all four cottons were checked on #89 machine for haze and lines. Dr. Nadeau stated he had checked with the Chemical Plant to see if there was any change in xx processing these batches, but they stated that they were unaware of any. It was agreed that the individual batches should also be tested on #89 machine for stripping.

#54 machine was reported by Mr. Babcock as showing some wet stripping on last two daily tests, whereas the other machines were OK. All tests were passable however. It was suggested that dryer temperatures should be checked on this machine.

The question was brought up as to whether or not daily tests should be increased to 17 ft. length to take advantages of the bottom of the loop, but after discussion it was urged that it was unnecessary to increase our waste by this move , since we have returned to old standard conditions and results are coming OK.

Low Viscosity Gel

Mr. Babcock exhibited a bottle containing a sample of low viscosity HS Gel solution which had been filtered thru the standard bag assembly. This sample contained an appreciable amount of foreign matter or insoluble matter, and it was urged that the kiefer mathod of filtration should be resorted to on HS Gel.

It was recalled that this method of filtration had been discussed and discontinued after having run for a month last summer because this was started at the same time we ran into static trouble at building #29. However, since this time two determinations have been made on percent solids and conductivity before and after using this method of filtration, and results have been found identical. Dr. Eilers felt, however, that he would like to see an analysis made on the amount of anti-static chemical and the amount of hardener both before and after filtration before going to the Kieffer method, and it was agreed to do this.

New Pump

Mr. Babcock reported that another silver sub pump had been delivered which is of the electro magnetic type, and that this was somewhat larger than the first one and capable of delivering about 4 gal. of sub per hour.

It was stated that with regard to the metal used, this pump should be entirely satisfactory to everybody, all exposed parts of the inside of the pump being silver.

M5 Cine

Dr. Nadeau reviewed an experiment in which a gel sub corresponding to D had been used in coating one roll of M5 Nitrate which was OK for stripping but which showed brittleness. A second roll corresponding to E strength was then run, but this roll also showed some brittleness, although indications were that bloom trouble might be somewhat better. He stated that they were planning to run another roll with a half step weaker in order to eliminate the brittleness and if satisfactory will run for a day on this type of sub. Mr. Babcock recalled that when M510 dope was first delivered to the coating room, that this type of sub was not satisfactory for stripping and warned that very possible the changes in the amount and quality of scrap being used at the present time might throw us into stripping trouble when a sub containing no acetone is used.

Mr. Babcock stated that stripping had been encountered on rolls of nitrate from #222 machine designed for foreign shipment, and it appeared that this stripping had come in at the same time as gel throwout was noted in the sub bottles which was due to residual traces of soap powder used in bottle cleaning. Mr. Wells stated that if the zero rolls came OK on the finished coatings that he would pass the rolls. However, Mr. Babcock stated that the stripping might be spotty and suggested that it might be a better plan to use these rolls for Domestic product testing a strip or two out of the bad areas to be sure that bad places were noted before product got to the trade. He also stated that he had found five bottles supposedly clean containing 6 or 7 cc. of water in which soap powder was present. An alkaline reaction was obtained with phenolphthalein, and when sub was run in one of these bottles it was decidedly more cloudy and showed gel throwout. Another bottle taken and rinsed out before running sub was quite clear. It is planned to improve the method of washing bottles, which roughly will constitute a soaking in hot water after which bottles will be inverted over hot water and steam jets, after which filtered air will be circulated for drying and bottles will be covered until used on the machine.

C O

Filters

A matter of filters on circulating systems was brought up, and it was noted that an all nickel bag filter can be constructed in Roll Coating Dept. for $25 per unit. It was agreed that we should push ahead with this system and have filters installed on all circulating systems. Such a filter takes care of metal grindings, and lint and fabric from packing in the pump stuffing box.

Diagonal Lines

Dr. Eilers noted that we were having more than the usual amount of trouble due to diagonal lines on X-ray which is due either to bubbles or slugs going thru the pan. He stated that the worst conditions occurred during the change of pans. Mr. Babcock stated that more than the usual amount of scrapings caused by rubbing of the cups was noted in the pans recently. These cups have been very carefully inspected for rough edges and nothing as yet has been found. The Coating Room has been cautioned not to turn the pans up any farther than necessary.; Dr. Carver wondered if a better sort of cup could be made where sulfur-free rubber was used assa bearing surface. It was noted that an appreciable amount of acetone was present in the Uct and this would undoubtedly swell the rubber. Dr. Nadeau thought that part of this trouble was due to the formation of flow lines in the hopper and stated this could be better controlled by feeding the sub in the middle of the hppper instead of at one end.

The pans with glass sides were disdussed, and it was urged that these pans be equipped with cups so they could be placed in a regular machine and a study made of the appearance of the Uct solution during regular operation.

The question of temperature of Uct in the circulating system was brought up, and it was noted that a temperature control could very easily be established inasmuch as a coil is already installed in the basement tanks for the Uct system. It was also suggested that a small stirrer placed in the tanks on the gallery might go far to eliminate the trouble.

GSB:S G. S. Babcock

Sub Conference of February 4, 1938

X-ray

Mr. Babcock reported that Londaon X-ray waw showing stripping on the SS side. It was questioned whether to change the sub or to wait for further results. It was finally decided to run two rolls with a weaker sub and two rolls with a stronger sub and compare them before making any sub change. Mr. Wells suggested that possibly the air on the X-ray machines is a cuase of stripping.

Dr. Nadeau reported some X-ray experiments in which the sub temperature was kept constant but the drum temperatures were varied. As the temperatures varied, the stripping varied considerably.

Drum Temp.	R.C. Dry	Testing Wet	R.C. HAST
80F	Peels	Sl	PlsM
85F	Peels	StrLeSl	PlsM
90F	Peels	OK	PlsM
95F	Peels	OK	Lp
100F	PeelsM	OK	Pos to Lp
105F	PeelsM	OK	Vsp
110F	PeelsM	OK	Ok to Vsp
115F	PeelsM to H	OK	OK
120F	StrM to PlsM-H	OK	OK
125F	Lp	OK	OK
130F	Pos to Lp	OK	OK
135F	Pos	OK	OK
140F	Sp	OK	OK
145F	Vsp	OK	OK
150F	OK to Vsp	OK	OK
155F	OK	OK	OK

Dr. Ndaeau said that experiments were planned to determine the relationship between dry, wet and heater-after stripping, sub strength and sub drum temperature. It was finally decided that during the next week a survey be made of the subbing drum temperatures by means of a surface pyrometer. The temperatures are to be taken morning, noon and at 5 P.M.

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T The question of variations in subbing drum temperatures was discussed, although no definite conclusions were reached. It seemed possible, however, that lack of capacity of 140F. water on the green line might be the cause of the difficulty. If this is found to be the case, it will be possible to overcome the difficulty by carrying the green line at a somewhat higher temperature. Mr. Wells pointed out that there might be considerable sludge or sediment in the drums which would cause poorX heat transfer, and Dr. Carver suggested that the use of detergents might facilitate the cleaning of these drums.

If the presence of the corroded material in the drums is important, it can be overcome by cleaning the drums with a hydrochloric acid wash followed by fresh water and finally a small amount of an anti-corrosion material in the water. Quiniline can be used in this instance. (Dr. Nadeau)

Dr. Nadeau reported an experiment in which the Gelva-acryloid U-coat was used on regular PSS4 base. The stripping and brittleness were satisfactory but some difficulty with skidding was experienced, the degree of skidding increasing with the U-coat concentration.

	Stripping			Brittleness			
				Along		Across	
	Dry	Wet	HAST	OS	SS	OS	SS
6% U-ot by Im.	Sp/Sp	OK/OK	Vsp/OK	40	50	50	50
7% "	Vsp/Vsp	OK/OK	Vsp/Vsp	80	50	80	50
8% "	Vsp/Vsp	OK/OK	Vsp/Vsp	90	80	100	80
9% "	Vsp/OK	OK/OK	Vsp/Vsp	100	70	100	80
10% "	Vsp/Vsp	OK/OK	Vsp/Vsp	90	80	100	100
6% U-ot by KP	Vsp/Vsp	OK/OK	Vsp/Vsp	50	50	40	40
7% "	Vsp/Vsp	OK/OK	Vsp/Vsp	90	90	100	90
8% "	Vsp/Vsp	OK/OK	OK/OK	90	40	60	50
9% "	Vsp/Vsp	OK/OK	Vsp/Vsp	80	60	80	50
10% "	Vsp/Vsp	OK/OK	Vsp/Vsp	100	90	90	90
Check	OK/OK	OK/OK	OK/OK	50	50	20	20

Further experiments are planned with the hope of minimizing the skidding by using a thinner resin U-coat.

S series of experiments using chrome alum in single subs for X-ray was reported. The results are quite encouraging, since it was impossible to obtain

satisfactory stripping with gel subs containing less gelatin than can be used without hardener. It was also pointed out that much higher water contents were used in this sub than can be used if the hardener be omitted. Mr. Wells questioned the aging qualities of such support, and it was pointed out that a recent report from Vincennes indicated that after-hardening did not affect this type of sub. The use of formaldehyde hardening has shown bad aging results, and this experience is shared by both Vincennes and Kodak Park. Dr. Nadeau stated that the use of chromium chloride instead of chrome alum is to be tested since the stability of such a sub should be better.

Another series of results was reported in which the composition of the U-ot was varied in order to control the adhesion between the gel sub and the under-coat. In this study, PR cotton was mixed with the F cottons. The stripping and brittleness results were encouraging, and require further work.

CWFoot./PR	Stripping Testing R.C. Dry	Stripping Testing Wet	R.C. HAST	Along OS	Along SS	Across OS	Across SS
90/10	PeelsM/Pls	OK/OK	Str-Pls/Lp	60	100	30	100
85/15	PeelsM/PlsH	"	Sp-Pos/Pos-Lp	90	70	30	70
80/20	StrH/StrM	"	Vsp/Vsp	30	40	20	70
75/25	OK/Vsp	"	OK/OK	30	10	10	20
70/30	Lp/Str-LpH	"	Ok-Vsp/Vsp	40	80	30	30
60/40	PlsH/PlsM	"	Pos/Sp	30	90	30	90
50/50	StrH/Eph	"	SpH-LpH/PlsM	60	70	40	80
40/60	Sp/StrH	"	Ok-Vsp/Pos	30	80	30	70
check	Vsp/OK	"	OK/OK	30	30	10	30

Mr. Starck made the following report on wetting agents, aluminum chliride and increased potassium chloride to reduce static in X-ray film. These observations were made in the coating alley in Building 29.

Saponin - One faint discharge.
Artic Syntex T - No static discharges.
Tergitol - Emulsion coats poorly. 50% faint discharges.
5% aluminum chloride - 80% faint discharges.
10% aluminum chloride - 50% faint discharges.
20% aluminum chloride - one faint flash.
14% potassium chloride - No discharges.
Two gel subs - No discharges.

Recordak

Dr. Nadeau reported an experiment featuring the use of a removable jet backing for Recordak film on M-3-2501 base. This backing involves the use of cellulose acetate phthalate and a jet solution containing the wetting agent Aerosol. Without the wetting agent the backing cannot be removed due to the oiliness of the jet dye. Two-day incubation of this film shows no transference. Further test results will soon be available. Also a sample was processed in Building 5 and the results were entirely satisfactory.

M-5

It was reported that the use of methyl alcohol water subs for M-5 was possible. The desirability of this change lies in the possibility of overcoming waste due to comb lines and haze. As a result of the original test, a full roll of support was made on which the stripping was OK and the brittleness was Slight. It was pointed out that by coating single rolls with progressive changes in sub strength, the proper strength of sub for continuous coating could be arrived at. Mr. Babcock questioned whether or not a methyl alcohol-water sub would be adequate to overcome variations in the dope, and it was pointed out that it would be necessary to put a single machine on this type of sub and run for a fairly long time before this question could be answered.

PR and RP cottons

Mr. Babcock questioned the advisability of mixing PR and RP cottons in the dope system on the basis of possible stripping and brittleness difficulties. This question was discussed although no final decision could be reached without some actual experience in subbing the material. The proposal made by the Chemical Plant was necessary by reason of the curtailed production of RP cotton.

Kodachrome

35 mm. Kodachrome

Dr. Eilers reported that a little stripping along the edge was noticed on 5260-60-2 which was made with the mixed nitrate-gelva sub. Dr. Nadeau pointed out that the stripping could be materially improved by the use of a 200-series gel sub instead of the 150-series used on the above roll. A similar difficulty was experienced with the same subbing technique on Cut Sheet Kodachrome where, due to the low speed of coating, insufficient gel was applied by the gel sub.

The use of this sub eliminates the tendency of the emulsion to shatter from the support and also overcomes the difficulty of emulsion cracking in the camera at low humidities. It also eliminates sub lines and reduces the degree of dye retention.

16mm. Kodachrome

Five rolls of product have been coated with the mixed gelva - nitrate U-coat for 16 mm. Kodachrome with satisfactory results. The color balance resulted in somewhat cold highlights, although Mr. Cook pointed out that this can be adjusted in the thickness of the emulsion layers.

SR Kodachrome

Dr. Nadeau reported results on two rolls of S R Kodachrome, one having been made without the lubricant, and the other with the gelva - nitrate sub. Both rolls are free from transference on six-day incubation and both Dr. Dearing and Mr. Cook are anxious that we change to the gelva - nitrate sub by reason of improved color balance and freedom from sub lines.

Dr. Eilers suggested that inasmuch as the mixed gelva- nitrate sub required one less subbing place than the two C-subs, the cellulose acetate application be moved from the 7A position to the 7th. This would result in better quality support in all probability since the high temperature at the 7A place usually results in bad draw lines.

It was reported that the use of polyvinyl phthalate as a sub between the cellulose acetate phthalate and the support eliminated haze on the back of the processed SR Kodachrome film. When the necessary information is available, the results will be reported to the Patent Department by sketch sheet.

It was reported that a recent experiment dealing with over-coating the Kodachrome film with the UV filter indicated that XX 1-1/2% dye in the formula be used. As soon as emulsion coated support is available some full-width coatings on 87 machine are planned.

During the conference Mr. Cook called and requested 3,000 feet of S R Kodachrome to be used for test purposes in the Park, and it was decided to coat the film without lubricant and use P V T under the cellulose acetate phthalate. The coating was planned for Saturday, February 5.

G. F. Nadeau

CONFIDENTIAL

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Sub Conference of February 11, 1938

Kodalith

The question was raised as to whether or not a new type of sub could be developed for Kodalith and Wire Photo since considerable trouble has been experienced from impressions caused by gel throwout and strong attack of the sub. Dr. Nadeau said chrome alum hardening, on which experiments are being run, might help. Mr. Seel suggested the use of a C-sub and gel sub, but Dr. Eilers said that this could not be used because emulsion does not coat well on it. Dr. Nadeau explained that the sensitizing dye was retained by the sub. The use of detergents in the sub was suggested. Dr. Nadeau stated that experiments have been planned.

Mr. Wells suggested that the mixed gelva-nitrate U-coat developed for Kodachrome be tried on Kodalith film base. Mr. Seel asked that this experiment be run, along with an experiment featuring Novonacco. Dr. Eilers thought that any experiments on Kodalith should be coated to Super Speed Wire Photo emulsion, since this emulsion shows the most dye retention.

Mr. Seel asked that an experiment be run putting over a gel sub an extremely thin coat of Nekal - approximately .1% or less. He also asked that the three Different chemicals, Kodak (lactic acid) #5 (salicylic acid and Pathe, be coated up to wire photo emulsion and compared with regard to stain.

Super Speed Stripping Film

Dr. Eilers stated that detergents possibly might eliminate altogether the glue coating on Super Speed Stripping film. It was brought up, however, that the emulsion will not coat on the detergent. Mr. VanDerhoef suggested leaving an edge on the film so that the emulsion would not fall off.

N-5

Mr. Wells reported stripping and brittleness on N-5, especially that from 223 machine, the stripping and brittleness range being quite narrow. A discussion followed concerning weakening the gel sub by steps of .5% to improve the stripping. The varying water content of solvents used in the sub as a possible cause of the stripping was discussed at length, it being decided finally to analyze the subs for water content from

day to day for about a month. Mr. Babcock will send samples of the sub to building C for this analysis, along with a check sample. Mr. Seel suggested using anhydrous methanol and anhydrous acetone for sub making and Dr. Nadeau suggested distilling recovered methanol, since these solvents would be nearly free of water. The possibility of the gelatin picking up moisture was dismissed since so little gelatin is used in the sub for N-5 Cine. Mr. Wells said that Mr. Kocher should be consulted concerning the question of water in the solvent.

Dr. Nadeau reported that an experiment in which methyl alcohol - water subs were used on N-5 showed satisfactory results on stripping, brittleness, bloom and comb lines but that the rolls showed more positive curl than those with the regular sub. Mr. Wells thought that an explanation of this might be the acetone flashing off. It was pointed out, however, that no acetone was used in the sub. Mr. Seel suggested putting varying amounts of ethanol in the sub to decrease this curl.

Dr. Nadeau reported that experiments had been planned on a machine in bilding #53 which has more curing after the sub application and believed that the curing would take care of curl control.

It was decided to try subbing N-5 at the wheel position on 45 machine and to check the curl of the base on the machine.

Mr. Seel suggested testing the suitability of XP with the N-5 type sub for Topographic Aero.

X-ray

Dr. Nadeau exhibited a graph of the static picked up near the windup on 47 machine during a period of two and a half days. It showed that two gel subs give much higher positive electrification than the N S gel. More negative charges are shown after hopper changes. After fresh bottles of sub are put on, the static discharges decrease. Further records are to be made. Extensive experiments on 89 machine have been planned with the static recording instrument.

Mr. Starch exhibited charts of stripping results against subbing drum temperature on the PSS4 X-ray machines where strong, medium and weak subs were applied to F cotton D-coat at varying sub drum temperatures. With strong subs, the stripping did not vary with the subbing drum temperature. When using medium subs, the stripping varied from PlaE at a drum temperature of 80F. to OK with a drum temperature of 155F. A weak gel sub showed Str to Pls at 80F to Pos to Vsp at 155 F.

Mr. Starck also showed a chart of the temperatures of the of the drum at the third and fourth subbing positions on all the X-ray machines covering a period of one week. In each case the temperature of the subbing drum at the third hopper place (OS side) was higher than the temperature of the drum at the fourth place, (SS side), and there was a variation in temperature of 10 to 12F. on either side of the 140F limit. The thermometer readings did not agree very well with the surface temperature readings. Dr. Nadeau suggested that this could explain the tendency of No. 1 emulsion to strip.

Dr. Gould will look into the question of proper control of dryer drum temperatures and will notify Mr. Starck who will then arrange for a further dryer drum temperature survey.

Controlling the temperature of the subbing drum was discussed. Mr. VanderHoef thought that instead of the hot water inlet and outlet in the drum being at the same end of the drum, the water should come in one end of the drum and go out the other. The possibility that the circulating system now used for the green line on the coating machines was inadequate was discussed. Putting an individual circulating system on each machine was suggested by Dr. Eilers.

Mr. Starck reported that the static experiments using detergents, increased potassium chloride and aluminum chloride are equal to the check on three-day incubation.

Kodachrome

Dr. Pleger reported that incubation tests on experiments with the new type of gelva - nitrate sub on 35 mm. Kodachrome were satisfactory. This new type of subbing showed no shattering, while the old KP type showed bad stripping.

Since a little stripping was encountered on Kodachrome experiments using D-150 sub, it was recommended to use D-200 sub instead, in order to eliminate the stripping trouble. If this experiment is also OK for stripping and transference, Dr. Gould will use the D-200 instead of the D-150 sub on the ten rolls of Kodachrome he is running.

It was decided to make a 1,000 foot roll of 16 mm. Kodachrome on M-3-2501 dope with the mixed gelva - nitrate U-coat and D-200. Mr. Seel agreed to this.

Dr. Nadeau reported testing a new cellulose acetate phthalate made from A-13 acetate. This acetate is commercially available at Kingsport and is cheaper than the S F acetate. The high acetyl content of the A-13 acetate caused the acetate to stick better to the base, and due to that fact that it is more soluble, the solvent action of the dye solution and cellulose acetate phthalate solution can be reduced. Using this acetate would give no haze, and a very thin coat could be applied to the film base without the dye striking through and staining the base. This might be applied in three different ways.

1. The cellulose acetate phthalate directly on the base, followed by the dye.
2. The cellulose acetate phthalate, dye and detergent applied in one operation. (This looks most promising, since it leaves no residual stain.)
3. The cellulose acetate phthalate followed by another thin application containing dye.

Dr. Eilers suggested applying the cellulose acetate phthalate in two applications by KP hopper at a 400 foot speed, rather than in one application by immersion hopper. This change should reduce trouble from creasing.

Dr. Nadeau reported that the coating of PVT (poly vinyl phthalate) on S R Kodachrome comes off too easily in the developing solution. To prevent this, he recommended that a tube be put ahead of the developing tank with .01 normal alkali. This appears to work satisfactorily.

An experiment was described in which an increased amount of glycerin was used in the PVT to prevent shattering of the backing on SR Kodachrome when the support is slit. This material will be emulsion coated Monday, February 14.

By reason of the removal of the backing during processing, some difficulty is experienced in setting a thickness range for S R Kodachrome. Mr. Wynd has been asked to measure wear and tear on S R Kodachrome of normal and minimum thickness to determine whether or not this problem will be serious from a wear and tear standpoint.

Recordak on M-3-2501

The question of going to Recordak on M-3-2501 base with the bleachable backing was raised. Mr. Wells said that machine capacity was a limiting factor. Dr. Nadeau reported that the 150 foot roll of this material had been tested and found OK for stain, transference, bleaching and Building 5's testing for removal. From time to time samples of the film being incubated are processed in building 5 to make sure that no hardening or aging action takes place.

C.F. Nadeau

Sub Conference of February 18, 1950

X-ray

Mr. Wells reported that the tension rolls on 55 machine eliminated the vibration lines on that machine, therefore, rolls of this type will also be installed on 56 machine.

The static experiment containing Arctic Syntex in the N S gel, to the extent of 25% of the weight of the gel, was reported as very encouraging, although the sample showed more fog on six-day incubation than the check. Consequently a series of experiments with progressive ratios of Arctic Syntex has been planned in order to determine the correct proportion of detergent.

Dr. Nadeau reported that the rolls of X-ray with the low viscosity N S gel were OK on incubation and OK for both Testing Department's and Emulsion Coating's static. Mr. Seel has agreed to the making of ten full rolls of this material.

Dr. Nadeau reported that the X-ray support with 14% potassium chloride in the N S gel as being all right on nine month's keeping. This is the minimum quantity of potassium chloride that can be used in the N S gel and give consistetly good electrification results. Dr. Gould has started the coating of ten rolls of X-ray with 14% potassium chloride on one side only.

Experiments are being run with the N S gel on the OS side instead of the SS as Emulsion Coating wants to put the emulsion on the opposite side of the film. Also the use of spreading doctors in the N S gel is being tried for Mr. Seel.

It was reported that the X-ray support with the double gel subs which showed higher positive charge than the regular N S gel as picked up by the instrument developed by Mr. Lankes showed no blotch static in building 29 but was finally discarded because of static.

A static chart was exhibited which showed an unusually high temperature at the 4th subbing dryer on 47 machine and it showed a more negative electrification. When the low viscosity N S gel experiments are run, the static instrument will be used for static measurements. The question was brought up as to whether or not a double stock of gel would help reduce the negative charge. However, an experiment has been run and will be tested for electrification soon.

Mr. Wells said that some time ago Mr. Schoen ran some electrification tests and found that static seems to work out of the rolls of film. He suggested that since three or four weeks' aging might cause the rolls to lose quite a bit of static, a stock of X-ray be built up.

Readings were taken once a day and charted by Mr. Starch of the temperatures of the subbing drum at the third and fourth positions of the X-ray machines. These results merely confirmed those reported at last week's conference. Dr. Nadeau reported experiments in which the dryer drum temperature was fixed and the temperature of the sub varied from 45F. to 170F. This variation does not affect the stripping. An F sub which should be OK at 70F. sub temperature was used.

Dr. Nadeau reported results of the dope experiment which was run on M-5-2500 type dope to get better flatness without going to bad brittleness on X-ray film. Dry, wet and heater after stripping was solid OK, start and finish. The brittleness results are as follows:

	Along		Across	
	OS	SS	OS	SS
48-3076	40	20	40	0
48-3077	30	30	30	30
56-1123 (check)	10	0	10	0
4607767 (check)	0	0	0	20

As soon as flatness tests have been run, some more of this material will be coated and sent out to the trade.

Mr. Babcock reported that various low alcohol soluble cottons were tested individually and together and found to be OK for wet stripping. Dr. Eilers questioned whether or not ther could be another range of stripping on the low alcohol soluble F cotton, suggesting that a weaker sub might be OK. Dr. Nadeau said that by going higher in% strength, another range could be obtained.

Experiments are to be run with 1%, ~~XX~~ 1.25% and 3% triphenyl phosphate in both the U-coat and gel sub to determine what effect it has on stripping.

M-5

Mr. Wells described a physical testing device similar to the Mullen tester which pushes a plunger through the film and measures its strength by the condition of the torn film. He thought it might be well to use one in testing M-5 support.

Two experiments on M-5 support designed to reduce the high positive curl by more curing after the sub application are being followed. Mr. Babcock reported that the sub used on these experiments was found to be tacky. Dr. Nadeau said that cutting down the gel stock possibly would eliminate this.

Mr. Babcock reported some stripping results from 225 machine. With OK stripping, the brittleness was poor; with poor stripping, the brittleness was OK. Dr. Eilers wanted to run one roll with a slightly stronger sub and one roll with a slightly weaker sub and compare the stripping.

Kodalith

Dr. Eilers suggested cutting down the gel stock on Lidalith film in an attempt to eliminate stripping difficulties. Dr. Nadeau said that the result of cutting down the gel stock can be determined in the Wire Photo experiments being run, as the gel stock was reduced in them.

Kodachrome

Dr. Pleger reported that the subbing procedure worked out on M-3-2501 Kodachrome (D-200 and mixed cotton-gelva U-coat) seems quite satisfactory. Since this subbing works so well on M-3-2501, he thought that eventually 16 mm. Kodachrome could be transferred to it. Color balance is the only limiting factor, but it is believed that this defect could be corrected by the Emulsion Coating Department in another coating. It was decided to start an approval sheet to coat 5,000 feet of 16 mm. Kodachrome on M-3-2501 base.

Dr. Gould thought that this mixed gelva nitrate sub tends to cause physical lines in the support that seem to form as the support comes from the hopper. Dr. Pleger's opinion was that these lines were caused by too strong a U-coat on the back. He suggested cutting down the strength of the backing, but it was pointed out that this would probably cause it to gel. He also believed that too high a temperature at the 7A place on 53 machine causes bubbling of the sub, which, in turn causes defects in the film. As a remedy for this, he suggested either lowering the temperature or changing the subbing position. Dr. Gould pointed out that changing the threadup would cause about 1600 feet of waste. Mr. Wells suggested a small heater and thermometer with thermostat to regulate the water temperature. Mr. Babcock thought that cutting down the speed of the sub roll might help.

Dr. Nadeau reported that the results were poor on the experiments featuring the detergents in the gel sub to eliminate dye retention on Kodachrome.

SR Kodachrome

Putting an approval sheet for the production of Kodachrome with the removable anti-halation developed by Mr. Slack was discussed, and the mixed gelva nitrate U-coat was discussed.

Mr. Wells agreed to Dr. Eilers suggestion that an S.E.R. be started for two circulating systems for 53 machine. This should reduce the amount of acetate phthalate used in the production of S R Kodachrome anti-halation backing.

L S Cut Sheet

A report on experiments with varying amounts of detergents in B-150 gel sub on L S Cut Sheet showed there was no improvement, although with Aerosol there was a slight tendency toward less dye retention. Other experiments will be run using these and other detergents with a weaker sub.

T B Stripping Film

Experiments featuring detergents in both the glue and skin layer of stripping film were reported by Dr. Nadeau as not particularly encouraging, since the stripping time was not affected.

Attempts to coat the glue in the Roll Coating Department instead of the Emulsion Coating Department in order to reduce waste have been very successful except that the emulsion tends to skid off the base and puddle. Emulsion Coating will try to make changes in emulsion drying conditions and Roll Coating will try to alter the glue in some way. If neither of these eliminates the puddling, Mr. Coleman believes that using this method and cutting out the loops will still reduce the waste considerably.

Translite

Mr. Babcock showed a sample of Translite film base that had been coated to Kodalith emulsion. The brittleness was very good as compared to regular Kodalith but the film had quite a number of lines.

C.F. Nadeau

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Sub Conference of February 25, 1938

N-5

Some time ago methyl alcohol - water subs without active solvents were incorporated in an experiment on N-5 and showed more positive curl than the check. Following this up, an experiment was run on Classes 11 and 14 N-5 Cine on 224 machine where the increased curing capacity was to reduce the curl. Dr. Nadeau reported that the class 11 still was about 5/32 more positive than the check but that the Class 14 was all right. Shrinkage results are not yet available. It was decided to follow Dr. Carver's suggestion to determine the curl on the N-5 raw support.

Dr. Carver suggested using 89 machine for some N-5 curl experiments but it was pointed out that the lack of sprinklers on this machine prevented running nitrate support there. It was decided that steps should be taken toward installing sprinklers at the windup and take-up roll.

It was questioned whether or not regular Class 14 coating conditions were used in coating the Class 14 experiment. This will be looked into.

In this connection Dr. Pleger said that on Kodapak when mixtures of water and methyl alcohol were used, curl resulted, but when plain water or plain methyl alcohol was used, a fairly flat sheet resulted.

Dr. Nadeau said that something would be done to correct the curl on Eastman Acetate Sheeting making use of the effectiveness of methyl alcohol - water mixtures.

Mr. Babcock reported that 823 machine is running satisfactorily on production so far as stripping and brittleness are concerned.

Mr. Starck asked as to the disposition of a 1,000 foot roll of experimental N-5, 43-6051, which showed about 5/32 more positive curl than Class 11. Mr. Wells said to check up the roll and he would discuss it with Mr. Seel.

X-ray

Mr. Wells said that some fog had been noticed lately on X-ray. Dr. Eilers reported that Mr. Klem had tested five

X-ray rolls for fog. The first roll showed Ok, but the second and fourth showed fog. Mr. Klem is going to strip off the side to see if the increased amount of anti-static chemical can be causing the trouble.

Dr. Nadeau reported six-day keeping and one-week tropical incubation on X-ray rolls with low viscosity MS gel.

	Six-day			
	Top	Center	Top	Center
49-1167	Vsl .17	Vsl .17	Vsl .07	Vsl .05
49-1166	Vsl..20	Vsl .19	Vsl .07	Vsl .07
Check	Vsl .18	Vsl .19	Vsl .07	Vsl .07

Dr. Nadeau reported three-month incubation was all right on the experiments featuring M S gel containing increased methanol.

Dr. Nadeau exhibited a chart made by Mr. Schoen showing static picked up on 48 machine during a production run. The chart proved that film support varies in its electrification. Dr. Eilers suggested installing pickup devices on all the X-ray machine which would be connected to one main recorder. This need not be run continuously but perhaps at intervals of 10 minutes. This would indicate static variations in the machines.

Dr. Eilers said that single subbed acetate X-ray gives better fog and mottle than nitrate U-coat - gel subbed X-ray, therefore, the high fog on the latter must be due to something in the cold washed F cotton. It was agreed that this should be looked into.

Mr. Starch thought that since the surface drum temperature on 55 machine shows variations, the air temperature should be determined by an alcohol thermometer inside the casing in the drum. It was decided to do this.

Mr. Babcock brought up the question of disposing of 10,000 pounds of low alcohol soluble F cotton on hand. This was discussed, but nothing definite was decided.

DS Gel

Mr. Babcock reported that incubating and comparing D S gel in the sub with regular gel in the subthat the regular material was not quite as good as the special roll. Mr. Babcock will therefore start an approval sheet to go

to the use of D S gel on one machine.

X-ray

Dr. Nadeau reported three and six-day incubation results on static experiments with the following features.

	3-day		6-day	
	Top	Cent.	Top	Center
Weak gel sub	.05	.05	.17	.19
N S Gel containing increased KCl	.05	.05	.25	.25
N S Gel containing 4x% aluminum chloride	.07	.07	.30	.31
N S Gel containing 2x% aluminum chloride	.07	.07	.23	.27
N S gel containing Arctic Syntex T.	.07	.07	.27	.27
N S gel containing Saponin	.05	.05	.20	.21
Check	.05	.05	.19	.17
N S gel containing x% aluminum chloride	.07	.07	.23	.25

Mottle was Val on experiments and check.

Mr. Starck reported that the repeat experiment using Arctic Syntex paste and powder showed that from 20 to 25% weight of gel of the powder was necessary to eliminXate static; low concentrations of the powder gave many brilliant static flashes. The experiments using paste in concentrations of 5%, 10%, 15%, 20% and 25% weight of the gel all gave static.

Hardener in Subs

Dr. Nadeau said that the chrome alum hardener continues to look well and that a coating should be made on one of the large machines so that the support can be emulsion coated in a wide alley to determine what effect these drying conditions would have on after-hardening. There was discussion on Blue AA X-ray waste as compared with waste on regular material.

Kodachrome

An approval sheet has been started to make 5,000 feet of the mixed gelva nitrate sub for 16mm. Kodachrome.

Mr. Wells stated that the thickness limit on SR Kodachrome had been increased from five and a quarter to five and a half thousandths.

Dr. Nadeau said that residual stain, haze, removal and density tests for S R Kodachrome should be taken at

the machine, preferably by the Color Tester. This could be done by simply dipping the sample in developer and wash water.

Stripping Film

Dr. Eilers suggested the use of polyvinyl phthalate on Stripping film in place of the glue layer. Dr. Nadeau reported that development work on coating glue in Building 21 on T.B. Normal Support was completed.

Wire Photo

Super Sensitive Wire Photo shows very bad dye stain and experiments are under way to develop a satisfactory sub for this emulsion. The indications at the moment are that any sub involving the use of nitrate cotton shows bad stain, whereas single gelatin subs and mixed cotton gel subs appear satisfactory. A small machine coating has been made and tests will be available soon.

Miscellaneous

Dr. Eilers wondered if some sort of an emulsion coating set-up could be installed in the Roll Coating Department for emulsion coating small pieces of support in order to obtain an indication as the stripping, brittleness, etc., of the coated film. Also, the narrow-width coating machine, SB, in Building 29 which is used for such work at present is taxed to capacity and it is sometimes necessary to wait a week or more for results.

C. F. Nadeau

Sub Conference of March 4, 1938

X-ray

Mr. Schoen exhibited a chart of the static picked up on 47 machine during both an experimental and a production run. The experiment consisted of the following features:

	NS gel with Red Doc	Very good, practically neutral charge.
	NS gel with Yellow Doc	" " " "
NS	NS gel on the OS only	Very poor, highly positive.

It was suggested and decided to record the static picked up while varying the tension of the support. Mr. Seel also suggested determining what effect varying tension would have on the sub and color applications.

Dr. Eilers pointed out that on 47 machine the pick-up needle for the static instrument is on the "best" side- where the sub tends to be fresher. He suggested that the needle be moved to the other side of the support to obtain a more critical test.

Mr. Schoen stated that increasing the draw-off of the gel sub had no effect on the charts. Dr. Carver suggested cutting the feed into the sub hopper until no draw-off is obtained and studying the effect of this on the static.

Mr. Seel suggested applying triphenyl phosphate either in or over the N S gel subs to eliminate static.

Mr. Starck reported nine-day incubation results on some X-ray experiments employing the following features to eliminate static:

	Fog	Mottle
NS gel on OS side only	.22	S1
Yellow Doc	.22	S1
Red Doc	.20	Vsl
Check	.25	S1

Mr. Seel agreed to the production of 25 rolls of Class 29 X-ray. Dr. Gould will take care of starting the approval sheet for these.

Mr. Starck reported incubation results on X-ray static experiments using Arctic Synter paste and powder in varying amounts. The original for experiments and check was

.02 Fog and OK mottle. The three-day results were as follows:

Powder

	Mottle	Fog	
		Top	Center
5%	OK	.09	.09
10%	OK	.08	.08
15%	OK	.08	.08
20%	OK	.09	.09
25%	OK	.09	.08

Paste

5%	OK	.08	.08
10%	OK	.09	.09
15%	OK	.10	.10
20%	OK	.11	.10
25%	OK	.11	.11
Check	OK	.07	.06

He also stated that both experiments and check were equal on three-day incubation using 2x% and 4x% sodium nitrate.

Since it was reported that the water inlet temperature at the fourth position on 55 machine remains at 140F. and that the drum temperature varies only from 135F to 138F., it was decided to make the readings at the third instead of the fourth position. It is believed that the temperature fluctuates more at the third hopper position.

Hardener in Sub

Mr. Starck reported that tests are being run on experiments incorporating chrome alum in single subs on X-ray. Mr. Seel said that the emulsion quality tests for this type of experiment should be run on one of the large machines. Chromic chloride and chrome alum were reported as being quite similar in their action, eliminating wet stripping when using higher percentages of water and low concentrations of gel. However, with chromic nitrate when the percentage of gel is dropped to about .3%, wet stripping is encountered. Mr. Seel said that since Dr. Staud and Mr. Hauck have done considerable work on hardeners for gel, it would be well to contact them.

Aero

As an anti-halation for Aero, it was suggested that the backing that is used on S R Kodachrome be tried. Dr. Carver suggested using a grey backing. Mr. Seel asked that an

experiment be started using the grey backing on both acetate and nitrate dope for Aero. Dr. Eilers stated that seven rolls of safety Aero were to be produced soon and that an experiment could be run at that time. He suggested regular grey dye over a nitrate U-coat for safety Aero. The suggestion was made that a blue backing be used on safety Aero!

Dr. Eilers brought up the question of changing from two process nitrate Aero, which has been unsatisfactory lately, to three-process Aero. Mr. Wells pointed out that most of the trouble has been due to mechanical difficulties and that changing the idle rolls will take care of the trouble. If there is no improvement after changing the idle rolls, Aero production will be changed to three-process.

Removable Backing for Recordak

Dr. Pleger reported that although a black removable backing for Recordak has been worked out completely on M-3-2501 base, lack of machine capacity prevents using M-3-2501 for production. Experiments on PAC base using both A-13 acetate phthalate (now used on S R Kodachrome) and S F acetate have looked good. Mr. Seel thought that production should be started using PAC base and the A-13 acetate phthalate, after checking the shattering on this type of backing. Dr. Gould suggested using the S F acetate since there is a large stock on hand. Mr. Seel agreed to making a 1,000-foot roll using the S F acetate. He also asked that a 16 mm. run of the PAC experimental Recordak be run through the regular Recordak processing solutions and that a roll be sent him to check shattering.

Kodachrome

Safety measures to be used while making up solutions of A-13 acetate phthalate were discussed. Mr. Seel asked that Mr. R. Baybutt be brought over to Building 7 immediately to look into the question of static discharge while making up acetate phthalate solutions using the finely powdered acetate phthalate.

Dr. Pleger reported that the 500 feet of 16 mm. Kodachrome on M-3-2501 base came through warm but passable. Mr. Seel said that before this is released to the trade, it should be tested to see if it would go through the self threading projectors.

Dr. Pleger announced that he and Dr. Dearing would get together tomorrow to review the quality of subbing obtained on S R Kodachrome in the last few production runs to see if it was entirely satisfactory.

Dr. Eilers stated that a circulating system for the gelvacotton U-coat for S R Kodachrome was being installed on 53 machine.

Mr. Seel asked Dr. Pleger to send him processed rolls of 16 mm. Kodachrome on M-5-2501 and PAC bases in order to compare the flexibility of these two types of support. A discussion ensued between Dr. Carver and Mr. Seel as to the relative merits of PS84, M-3 and M-7 as regards limpness.

M--5

Mr. Babcock reported that some brittleness was encountered on 223 machine coating M-5. A weaker sub was used and the brittleness was corrected. Number 222 machine also showed brittleness, and the subbing cabinet temperature was being varied in an attempt to improve the brittleness. Inasmuch as the temperature of the subbing cabinet was found to be 161F., Mr. Babcock thought that a temperature survey should be made on the M-5 machines. Mr. Wells agreed to this. Product from 224 and 225 machines is also brittle.

Trouble is still being experienced with curl on M-5 support using mixtures of #12 and water to dissolve the gel. Dr. Pleger reported that Mr. Wilcox wanted to apply the subs on the OS side instead of the SS, as there are no wheel scratches on that side.

D S Gel

Mr. Babcock stated that ten rolls of Cine Negative had been made using D S gel which had been satisfactory. An approval sheet has been started to make another ten rolls with the D S gel.

Cine

Dr. Eilers suggested an experiment leading to the use of x-1000A type of subbing on all Jet Cine Kodak in order to drop all CAC subs. Dr. Pleger suggested that since such excellent results had been obtained on Kodachrome using a mixed gelva-cotton U-coat, the same type of subbing be tried on other safety products.

Sub Conference of March 11, 1938

S R Kodachrome

The blue dye for S R Kodachrome can now be applied without the phthalate carrier. However, complete tests have not come through yet. There was a discussion as to whether to continue the present run of S R Kodachrome and change over to the new technique when tests are received, to change over immediately or to stop the run and wait for tests. In order that the 86,000-foot order may be filled as scheduled, it was decided to continue as at present. Mr. Wells will discuss this matter with Mr. Seel and Mr. Cook.

Dr. Gould stated that he was coating one can of U-coat and one can of dye for S R Kodachrome which was filtered only. This is to be compared with support made with centrifuged material to determine if a filter could be purchased for the Sub Making Department instead of a centrifuge.

As a result of a discussion of the blue dye, Mr. Wells asked that four or five pounds of dye be sent to Dr. Staud who will try to remove the salts.

Dr. Pleger suggested trying some single subs on S R Kodachrome to get away from the nitrate in the sub. Dr. Nadeau stated that the unusual property of chrome hardened single subs warranted investigation for many uses.

X-ray

Mr. Babcock reported stripping and brittleness results on experiments featuring gel-glyptal subs. A previous run had shown some wet and dry stripping. Gel subs containing small amounts of glyptal, small amounts of chrome alum and gel-glyptal combinations with chrome alum all showed OK set stripping and good brittleness. Weakening the subs by adding water decreased the brittleness considerably, 4% water giving 100% non-brittleness. Another set of experiments are being planned checking the effects of different combinations. Dr. Eilers said that this type of sub should be checked for fog on incubation and keeping.

Inasmuch as the experiments with chrome alum hardener in single subs have proven so successful, Dr. Nadeau asked that

200 or 300 feet of full-width material with the chrome alum be coated so that long-period aging tests could be started as soon as possible. Mr. Wells said that because of production demands, it would be necessary to wait to coat this roll until 48 machine starts up some time next week. Dr. Eilers said that the float roll should be used when coating this material.

Mr. Babcock suggested that in a semi-organic compound such as ethyl sodium sulfate, the sodium ion be replaced by a chromium ion, thus making a more compatible material with which to work. Dr. Nadeau thought that some work along this line had been done.

Dr. Nadeau reported that Mr. Folwell and Mr. Silliek are working on the problem of improving the general quality of F cottons by studying washing treatment, methods of nitration, etc. Dr. Nadeau will run tests on this problem on 89 machine.

Dr. Gould reported that he had started an approval sheet to go to Class 89 Blue Cut Sheet on one X-ray machine. This type of support is much better from the standpoint of rabbit tracks and static. Mr. Wells suggested insufficient drying of the NS gel as a possible cause of rabbit tracks. Dr. Gould said that Class 29 is worse for South American curl tests than Class 2 8 X-ray. The question of swell and shrink amplitude was raised, Dr. Nadeau stating that the amplitude was the same on both types but in different directions from flat on the two types of support.

Mr. Starck reported that experiments with NS gel containing 5% potassium chloride were poor, the Class 29 check showed no static and the Class 28 check showed many brilliant discharges in Building 29. It was pointed out that very often the static results obtained in building 29 do not agree with Mr. Burroughs' static measurements.

Dr. Nadeau suggested emulsion coating both sides of a piece of Class 28 support to determine whether rabbit tracks were on the SS or OS side or followed Nol. emulsion. Dr. Eilers said that a piece of support which looks particularly bad for rabbit tracks should be used.

Mr. Starck suggested raising the temperature of the NS gel sub dryer to about 150F so as to increase the curing of the NS gel. Dr. Eilers said that this would increase bubbles, but it was pointed out that since the methyl alcohol content of the NS gel has been increased, the possibility of bubbles is slight.

Dr. Gould reported that he was changing the MS gel hoppers on 49 and 50 machines every second roll at the request of Mr. Paddock who believes this will aid in eliminating rabbit tracks.

Mr. Starck reported the following static results as determined in Building 29.

Red Doctor in MS gel	Left edge: no discharges.
MS gel on the OS side only:	Many bright discharges
Class 29 check	No discharges
Class 28 check	Left edge: many bright Right edge: many medium
#79 Doctor in MS gel	Few faint discharges

He also reported that the nine-day incubation results were very poor on experiments employing sodium nitrate. They are as follows:

	9-day		1-week tropical	
	Top	Center	Top	Center
2% sodium nitrate	.28	.27	.05	.04
4% " "	.27	.30	.05	.04
check	.19	.19	.05	.04

Mottle: Vsl on both 9-day and 1-week tropical.

Mr. Starck reported that the origisal incubation results were all right on experiments employing Arctic Syntax paste and powder to prevent static, quite bad on three-day incubation, the powder being the better of the two, and almost the same as the check on six-day incubation.

Dr. Eilers suggested that when single gel subs with the hardener are completely worked out, they be used on M-3 support to prevent wet stripping often experienced.

M-3

Mr. Babcock stated that all the M-3 machines in Building 35 were OK for stripping and brittleness.

S S Panchro Press

Dr. Eilers brought up the question of making some support for S S Panchro Press emulsion experiments to eliminate dye retention.

Jet Cine Kodak for 8S Pan

Mr. Starck is planning an experiment using a mixed sub followed by gel sub containing chrome alum.

Recordak

A removable backing for M-3-2501 Recordak is fairly well worked out. An experiment is under way to transfer this backing to PAC 47.

C. F. Madeau

Sub Conference of March 18, 1938

E. R. Kodachrome

Dr. Nadeau exhibited a sample of Blue S 2 Kodachrome product which showed fading of the blue dye on 24-hour incubation. As there was no fading between the perforations where the emulsion did not contact the dye, it would seem that the alkali of the emulsion bleaches the dye.

Dr. Nadeau reported that incubation results would be available Monday, March 21, on experiments without carrier in the blue dye. He stated that he was trying to find a blue dye which would be more stable. Mr. Wells asked if the dye must be blue. Dr. Nadeau said it should be either blue, green or black. Green would not be good for Integral leader protection.

Mr. Babcock reported that some of the Blue S Kodachrome product showed Peels Hard on dry stripping. The wet and heater after stripping has been OK.

Kodachrome

Dr. Pleger reported that due to some dry stripping encountered on Kodachrome recently, the gel sub has been changed from D-200 to CD-200 based on the following experiments on 89 machine.

Subs	Expt.	R.C. Dry	Wet	
K-1819, A	83x1152-1	Peels	OK	PlsH
" B	-2	OK	OK	OK
" C	-3	OK	OK	OK
" D	-4	OK	OK	PelH
" E	-5	Sp	OK	PlsH
" F	-6	Peels	OK	PeelsH
" G	-7	Peels	OK	PlsH
" H	-8	Peels	StrSl	Peels
" I	-9	Peels	OK	PlsH
" J	-10	Peels	OK	PlsH
" K	-11	Peels	StrSls	PlsH

It will be noted that the region of OK dry stripping is obtained with a much stronger sub than is necessary when covering a plain CAC sub in which case the OK dry stripping usually lies between E and H subs.

Detergents in Subs

Dr. Nadeau reported that the detergent-containing subs do not bleach any better than checks. Mr. Seel remarked that the detergent in the pelloid seems to help.

X-ray

Mr. Babcock reported that stripping has been good on all the X-ray machines, with the exception of 55 machine where the stripping wasI slightly affected. In this case the dryer temperature was low and will be raised to correct this condition.

Dr. Nadeau said that since the single subs with chrome hardener have been so successful and since a large coating machine is not yet available for this work, support will be made on 89 machine to carry out the long-period aging tests necessary. The experiments will feature single subs with formalin and chrome hardeners and a gel-glyptal sub with chrome hardener. The latter experiment is being run at the request of Mr. Babcock.

It was decided that 48 machine will be started the first of next week to test the float roll as a means of eliminating vibration lines on X-ray support. At this time the hardendd sub experiments will be run. Originally it was planned to coat five 500-foot rolls, but Mr. Seel thought that in order to save time, two rolls, between 500 and 700 feet long, should be run. One roll will feature formaldehyde hardening and the other chrome chloride hardening. Blue dye in the gel sub will be applied to both sides of the support to show more clearly any tendency towards cross lines. A regular production roll will be used as a check.

In connection with vibration line difficulty on 48 machine, Dr. Nadeau questioned whether or not the float roll alone could eliminate these lines. He thought that tension rolls probably would be necessary eventually if complete freedom from lines is desired. Dr. Eilers said that since the gel content of the single subs is low, cross lines should be reduced considerably. Mr. Wells asked about the slight differences in flatness between the single subbed material and regular material.

Dr. Nadeau pointed out that in all the anti-static N S gel experiments carried out in the Roll Coating Department the salt content increased fog on incubation. Dr. Pleger stated that Dr. Staud had added these salts

C O

to the emulsion to the point of saturation and had found this did not affect the fog at all. Mr. Wells thought that the nitrate layer on the film might be the cause of the fog.

B-S

Mr. Babcock reported that stripping and brittleness on Class 11 Cine has been satisfactoryl

Aero

Two-Process Aero

Dr. Nadeau stated that work on a two-process Aero is completed. This brought about a discussion of defects on the wheel in 12 machine. It was thought that some foreign material in the plating solution causes this sort of defect. Mr. Seel asked what had happened to the plans for enclosing the plating room. Mr. VanDerhoef had thought it too expensive. Mr. Seel asked that Mr. Tucker get together a record of the past costs of repairing wheel defects.

Mr. Babcock reported difficulty with stripping on some rolls of Aero support. Dr. Nadeau suggested startin an approval sheet through to change to C sub and gel sub on Aero. This subbing technique has been OK'd and is planned on Two-Process Aero. Mr. Young will be notified and asked to start the approval sheet.

Anti-Halation Topographic Aero

Dr. Pleger reported extra-curing and waterboxing regular Negative and Safety Cine Negative support for use as Topographic Aero. He believes this material to be uni-axial. Mr. Seel asked that this point be checked with Mr. Wynd. Dr. Eilers thought material of this type would be as good as regular Aero but not so good as regular Topographic Aero.

SS Ortho Press

Dr. Eilers stated that in the conference of March 11 when he spoke of S S Panchro Press he was referring to S S Ortho Press. Waterbored Portrait film with C sub and gel sub seems to be satisfactory for this product.

Kodalith

The question of putting one machine on Kodalith with C sub and gel sub was raised. Number 45 machine is the

only machine available for this purpose, and it is estimated to cost $8,000 to remodel it. The machine would be used for only Kodalith and M-5 Cine production since its coating speed will be low.

Dr. Nadeau reported coating a piece of Kodalith support with the new sensitized Ortho Kodalith emulsion. This case is the only one in which poor sensitizing dye stain has been noted with single sub.

S S Wire Photo

Dr. Pleger reported he was working on the problem of curl on S S Wire Photo. Several experiments have been run applying clearing solutions on the OS side. In all cases, the support curled too much toward the OS. Weaker solutions will be tried. Dr. Nadeau said that putting some sort of curl control backing on the support probably would necessitate doing away with the single subbing now used on S S Wire Photo.

Dr. Eilers suggested going to two types of support:

M-1-2000 for Kodalith (C sub and gel sub)
P884 for Wire Photo and S S Wire Photo.

Dr. Nadeau also suggested double subbed M-3-2501 for Kodalith.

C. F. Nadeau

Sub Conference of April 1, 1938

Tackiness on N-5 Cine

There was a discussion of the bad tackiness being experienced on Class 11 N-5 support from 223 machine. Mr. Wilcox thought that the best means of overcoming this trouble would be to change the threadup and sub the OS side instead of the SS. He believes that the penetration will be better on the OS side and that if the curl is affected, it will be more negative - which is desirable. He also stated that wheel marks do not show on N-5 support.

The fact was brought up that while 222 and 223 machines are on the same dope system, 223 alone shows this tackiness.

It was finally decided to run an experiment subbing the OS side with regular subs. Mr. Wilcox will run a full roll of the material.

Mr. Wells stated that the tower on 223 machine may be the cause of the tackiness, since it may cause case-hardening of the support surface.

It was pointed out that Class 16 support does not show this tackiness at all since it is rougher than Class 11. Dr. Nadeau does not agree with this explanation but attributes the difference to the different surfaces involved, namely, gel sub against nitrate vs. gel sub against acetate.

Since in previous experiments where the active solvents were reduced, the tackiness became worse, Mr. Babcock suggested that a higher percentage of acetone be used. This experiment will be run on 223 machine.

Dr. Robertson suggested the imbibition treatment but it was pointed out that there is no other hopper on the machine. Applying an acetate backing on all the N-5 machines to improve tackiness, as well as appearance and general quality, was suggested by Mr. Wilcox. Mr. Wells agreed to sign an approval sheet to install an additional hopper on each of the N-5 machines.

Dr. Nadeau reported that mixed nitrate-gel sub experiments are being run on 223 machine. Results will be available Monday.

Dr. Robertson stated that his survey of hoppers showed that hoppers on 223 machine are not the immediate cause of the tackiness trouble.

Mr. Wilcox said that the rolls might be rearranged so that they will hit the SS side to roughen it.

Mr. Starck suggested that since Arctic Syntex T in H S gel on X-ray makes the support more slippery, the detergent be added to the gel on H-5. This will be tried if Arctic Syntex T does not affect the stability of the gel sub used on H-5.

It was decided to ask Mr. Armstrong of the Safety department to see if arrangements could be made to run nitrate film experiments on 89 machine before the permanent sprinklers are installed around the machine.

Dr. Nadeau reported three months' keeping as all right on Class 16 using recovered methyl cellosolve in the U-coat and stated that an approval sheet should be put through to use this material in production. An approval sheet has already been signed to use recovered methyl cellosolve on L S Cut Sheet.

Eastman Duplicating Negative

Dr. Nadeau reported that curl tests were satisfactory on Class 16 support coated to Duplicating Negative emulsion. An approval sheet will be started to be signed by Dr. Carlton, Mr. Ireland and Mr. Cull and will be held by Mr. Klem until photographic quality tests are completed.

X-ray

Dr. Gould reported that there is one machine coating Class 29 X-ray (46 machine). Dr. Eilers said that a recent roll of this material showed a small amount of dry stripping.

Mr. Starck reported that one week's aging of the hardened gel experiments showed Val stripping on the formalin hardened samples. The others were OK. This is an indication of lack of after hardening in chrome